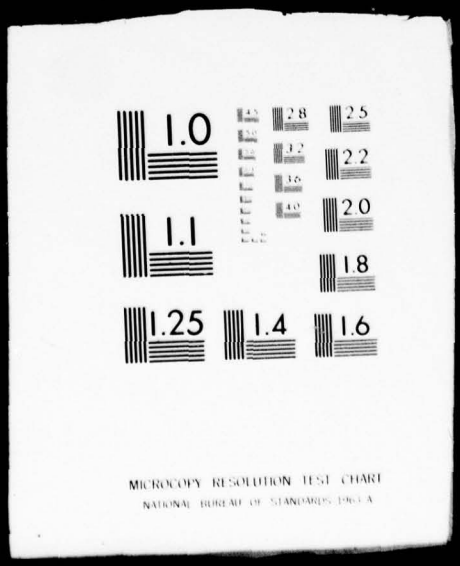
AD-A068 721 ROCKWELL INTERNATIONAL EL SEGUNDO CA LOS ANGELES DIV F/G 1/3
AIRCRAFT TRANSPARENCY FAILURE AND LOGISTICAL COST ANALYSIS. VOL--ETC(U)
DEC 78 S S BROWN F33615-77-C-3060
UNCLASSIFIED NA-78-604-VOL-3 AFFDL-TR-78-153-VOL-3 NL

1 OF 4
AD A068721



AFFDL-TR-78-153
VOLUME III

(2) LEVEL III

AD A068721

DDC FILE COPY

AIRCRAFT TRANSPARENCY FAILURE & LOGISTICAL COST ANALYSIS
VOLUME III TRANSPARENCY ANALYSIS

S. S. Brown

Rockwell International
Los Angeles Division
815 Lapham Street
El Segundo, CA 90245

DECEMBER 1978

Final Report June 1977 – September 1978

AIR FORCE FLIGHT DYNAMICS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

NOTICE

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

This report has been reviewed by the Information Office (IO) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

Charles A. Babish III
Laboratory Contract Manager

Richard J. Dobbek
Group Leader, Crew
Escape and Subsystems Branch

FOR THE COMMANDER

Ambrose B. Nutt
Director
Vehicle Equipment Division

Copies of this report should not be returned unless return is required by security considerations, contractual obligations, or notice on a specific document.

AIR FORCE/56780/16 April 1979 — 450

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: AFFDL-TR-78-153-Vol III	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): AIRCRAFT TRANSPARENCY FAILURE AND LOGISTICAL COST ANALYSIS VOLUME III TRANSPARENCY ANALYSIS	5. TYPE OF REPORT & PERIOD COVERED: Final Report June 77 - September 78
6. PERFORMING ORG. REPORT NUMBER: NA-78-604-VOL-3	
7. AUTHOR(s): S.S. Brown	8. CONTRACT OR GRANT NUMBER(s): F33615-77-C-3060
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Rockwell International, Los Angeles Division, 815 Lapham Street, El Segundo, CA 90245	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Program Element 62201F, Project 2402, Task 240203, Work Unit 24020302
11. CONTROLLING OFFICE NAME AND ADDRESS: Air Force Flight Dynamics Laboratory (FER), AF Wright Aeronautical Laboratories, AFSC, Wright-Patterson Air Force Base, Ohio 45433	12. REPORT DATE: December, 1978
	13. NUMBER OF PAGES: 200
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): 2402 / 03	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Available in DDC

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Transparency Systems, Aircraft windshields, Aircraft windows, Aircraft canopies, life cycle cost, regression analysis, candidate improvements, trade studies, fault tree , failure analysis, cost analysis, design parameters, environmental parameters.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The aircraft transparency and logistical cost analysis program is aimed at reducing the logistical cost associated with transparency systems for 20 of the current Air Force inventory aircraft. The approach for achieving this goal was to collect all information relating to the physical and performance characteristics, and maintenance historical data of the selected study aircraft. These data provide the means of initiating search for design improvement and cost reduction studies. Having collected the descriptors and characteristics of

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20 Abstract Continued

each transparency system; the Rockwell Maintenance Analysis Model (MAM)program was used to extract cost data from the K051 LSC system, and maintenance failure modes from the AFM 66-1 maintenance data collection system in order to conduct a detailed logistical cost and failure analysis. The cost and maintenance frequencies were utilized to pinpoint the most productive areas for life cycle cost reduction.

A number of potential improvement studies were identified in the initial phase of this program. However, the effort required to research, analyze, and assemble these data, limited the development to five design improvement studies. These factors, coupled with the relative importance of the aircraft in the Air Force inventory, initiated the search for concepts that would cure or substantially reduce the failures identified in the above noted MAM's process. The verification of the feasibility of the proposed changes was accomplished by trading the projected 10-year life cycle cost of the existing concept to the costs of the development, refurbishing, and the reduced maintenance for the revised concept. The five design improvement trade studies resulted in significantly reduced logistical support costs.

FOREWORD

The study presented in this report was performed by the Los Angeles Divison (LAD) of Rockwell International Corporation (Rockwell) under U.S. Air Force, AFSC, ASD, Wright-Patterson Air Force Base Contract F33615-77-C-3060. This study was performed for the Recovery and Crew Station Branch (FER), Vehicle Equipment Division (FE), Air Force Flight Dynamics Laboratory, Air Force Wright Aeronautical Laboratories, Wright-Patterson Air Force Base, Ohio under Project 2402 "Vehicle Equipment Technology", Task 240203 "Aerospace Vehicle Recovery and Escape Subsystems", Work Unit 24020302 "Aircraft Transparency Failure and Cost Analysis". Mr. C. A. Babish III (AFFDL/FER) was Laboratory Contract Manager.

This program was started 15 June 1977 and submitted by the authors for approval 29 September 1978. The report was released under NA-78-604 by Rockwell for internal control.

Mr. W. D. Dotseth was the Program Manager for Rockwell. Contributing technical personnel were S. S. Brown, Deputy Program Manager, Engineering Specialties; O. F. Niedermann, Engineering Specialties; H. L. Hayes, Transparency Design; R. H. Ewald, Jr, Operation and Proposals Estimating; and W. H. Hatton of Reliability.

The author wishes to thank the field audit contacts in the Air Force, in the airframe industry, and transparency suppliers for their cooperation and valuable assistance in collection of maintainability and logistical support data.

This report is assembled in three separate volumes to provide a presentation of study results that permits easier access to and handling of the data collected and presented herein. The separate volumes are:

Volume I - PROGRAM SUMMARY
Volume II - DESIGN DATA AND MAINTENANCE PROCEDURES
Volume III - TRANSPARENCY ANALYSIS

TABLE OF CONTENTS

Volume III Section		Page
I	INTRODUCTION	1
II	TASK III - TRANSPARENCY ANALYSIS	5
	Evaluation Process	5
	Candidate Improvement Selection Criteria	6
	Cost-Effective Trade Study	6
III	DATA ANALYSIS	13
	Data Analysis	13
	Development of Data for Analysis	14
	General Correlation	14
	Equations for Estimating LSC During the Conceptual Phase	15
	Equations Derived Using all Data	16
IV	CORRECTIVE PROGRAMS	41
	Design Improvements	41
	Failure Analysis	42
	Cost Analysis	43
	Trade Studies	44
	Design Improvement Trade Study 1, T-39A Windshield Anti-icing Controller Redesign	45
	Design Improvement Trade Study 2, KC-135A Boom Sighting Door and Window Redesign	56
	Design Improvement Trade Study 3, B-52G/H Windshield and Window Redesign	66
	Design Improvement Trade Study 4, C-141A Windshield Redesign	84
	Design Improvement Trade Study 5, T-38A Canopy Locking Mechanism Redesign	105
	Most Cost-Effective Parameters	116
	Least Cost-Effective Parameters	116
	Other Candidate Studies	116
V	CONCLUSIONS AND RECOMMENDATIONS	121
	Conclusions	121
	Recommendations	121

TABLE OF CONTENTS

Volume III
Section

	Page
APPENDIX A - SAMPLE MAINTENANCE ANALYSIS MODEL (MAMS) PRINTOUTS	123
Figure A-1, T-39A Design/Cost MAMS	124
Figure A-2, KC-135A Design/Cost MAMS	135
Figure A-3, B-52G/H Design Cost MAMS	156
Figure A-4, C-141A Design/Cost MAMS	174
Figure A-5, T-38A Design/Cost MAMS	196
REFERENCES	199

LIST OF ILLUSTRATIONS

Figure		Page
1	Study Aircraft	3
2	Aircraft Transparency Systems	4
3	Evaluation Process	8
4	Failure Analysis - Maintenance Analysis Model (MAMS)	9
5	Sample - Design/Cost MAMS	10
6	Sample - Maintenance Analysis Model (MAMS)	11
7	Cost-Effective Trade Study	12
8	T-39A Windshield Arrangement and Anti-icing System Diagram	47
9	Fault Tree T-39 Cockpit Transparency System	48
10	T-39A Transparency System Failure Analysis Summary	49
11	KC-135A Boom Door and Sighting Window	58
12	Fault Tree KC-135A Boom Sighting Window	59
13	KC-135A Boom Sighting Window Failure Analysis Summary	60
14	B-52G/H Windshields and Windows	70
15	Fault Tree B-52G/H Windshield Installation	71
16	Fault Tree B-52G/H Sliding Window	72
17	B-52G/H Windshield Failure Analysis Summary	73
18	B-52G/H Existing Windshield Configuration	74
19	B-52G/H Proposed Windshield Configuration	75
20	C-141A Windshields	88
21	Fault Tree C-141A Windshield Installation	89
22	C-141A Windshield Failure Analysis Summary	90
23	C-141A Existing Center Panel Configuration	91
24	C-141A Existing Main Panel Configuration	92
25	C-141A Proposed Center Panel Configuration	93
26	C-141A Proposed Main Panel Configurations	94
27	C-141A Existing Clear Vision Panel Configuration	95
28	C-141A Existing Side Panel Configurations	96
29	C-141A Proposed Clear Vision Panel Configuration	97
30	C-141A Proposed Side Panel Configuration	98
31	T-38A Windshield Canopy Locking Mechanisms	107
32	Fault Tree T-38A Canopy	108
33	T-38A Canopy Locking Mechanism Failure Analysis Summary	109
34	Proposed Configuration T-38A Canopy Hook, Operating Crank	110

LIST OF TABLES

Table		Page
1	Transparency Design and Operational Parameters Correlation Matrix	17
2	Aircraft Design Parameter Correlation Matrix	18
3	Base Environmental Characteristics Correlation Matrix	19
4	Parameters Which Have Strongest Correlation to Logistic Cost and Man-Hours	20
5	Estimated Canopy LSC Equations for Conceptual Design	21
6	Estimated Windshield LSC Equations for Conceptual Phase	23
7	Estimated Windshield and Other Cockpit Windows LSC Equations for Conceptual Phase	27
8	Estimated Canopy LSC Equations for All Variables	31
9	Estimated Windshield LSC Equations for All Variables	33
10	Estimated Windshield and Other Cockpit Windows LSC Equations for All Variables	37
11	Design Improvement Trade Study 1 - T-39A Windshield Anti-icing Controller Redesign	50
12	T-39A Cost Analysis (Windshield Temperature Controller)	51
13	Design Improvement Trade Study 2 - KC-135A Boom Room and Sighting Window Redesign	61
14	KC-135A Cost Analysis (Boom Door and Sighting Window)	62
15	Design Improvement Trade Study 3 - B-52G/H Windshield and Window Redesign	76
16	B-52G/H Cost Analysis (Transparency System)	77
17	Design Improvement Trade Study 4 - C-141A Windshield Redesign	99
18	C-141A Cost Analysis (Transparency System)	100
19	Design Improvement Trade Study 5 - T-38A Canopy Locking Mechanism Redesign	111
20	T-38A Cost Analysis (Canopy Locking Mechanism)	112

TABLE OF CONTENTS

Volume I Section		Page
I	INTRODUCTION	1
	Introduction	1
	Background	2
II	REQUIREMENTS AND TASK DESCRIPTION	6
	Program Objectives	6
	Program Requirements	7
	Study Aircraft	8
	Transparency/Support Systems	8
III	TRANSPARENCY SYSTEMS LOGISTICAL COST	12
	K051 Logistical Support Costs	12
	LSC for Study Aircraft	13
	Annual Support Costs	13
IV	CURRENT MAINTENANCE PROBLEMS	19
	Field Audit Comments	19
	Transparency System Comparison	21
V	SUMMARY OF TRADE STUDIES	24
	Trade Study Objective	24
	Trade Study Summary	24
	Trade Study Criteria	25
	Trade Study Descriptions	25
	T-39A Windshield Anti-icing Controller Redesign	26
	KC-135A Boom Door and Sighting Window Redesign	27
	B-52G/H Windshield and Window Redesign	27
	C-141A Windshield Redesign	28
	T-38A Canopy Locking Mechanism Redesign	28
VI	CONCLUSIONS AND RECOMMENDATIONS	44
	Conclusions	44
	Recommendations	46
	Candidate List of Design Improvements	47
	REFERENCES	51

TABLE OF CONTENTS

Volume II Section		Page
I	INTRODUCTION	1
II	TASK I - COLLECTION OF DATA AND INFORMATION	3
	Aircraft Transparency System	3
	Master Transparency Systems List	3
	Transparency Configuration Summary	4
	Transparency Panel Design Characteristics	8
	Laminated Windshield/Window Panels	8
	Monolithic Windshield/Window Panels	9
	Canopy Enclosure With Flat Laminate Windshield	9
	Canopy Enclosure With Contoured Windshield	10
III	TASK I - QUALIFICATION TESTING PROCEDURES AND REQUIREMENTS	51
	Testing Procedures and Requirements	51
	Development Programs	52
	Certification and Qualification Requirements	53
	Assessment of Qualification Costs	55
	Test and Procedural Cost Data	55
	Bird Proof Test Costs	55
	Maintenance and Installation Procedures	57
	AFLC - Reliability and Maintenance	57
	AFM 66-1 Maintenance Data Collection System	58
	AFM 65-110 Standard Aerospace Vehicle and Equipment Inventory, Status and Utilization Reporting	58
	AFM 127-1 Accident/Incident Data	58
	K051 Increased Reliability of Operation Systems	58
IV	TASK II - AFLC FIELD AUDIT OF PROCEDURES AND COST DATA	64
	Field Audits	64
	Metric Conversion Programs	66
	Cost of Transparent Enclosures	66
	Installation and Maintenance Procedures	67

TABLE OF CONTENTS

Volume II Section		Page
	Preventive Maintenance Procedures	67
	Electrical System Checkout Procedures	68
	Sealant and Aerodynamic Smoothing Requirements	68
	Checkout Procedures for Mechanisms and Operable Windows	70
	Corrosion Prevention	73
	Refurbishment Procedures	75
	Description of Maintenance Facilities	78
	Level of Transparency Capability	79
	Maintenance/Repair Work Breakdown Structure	85
	ALC Storage Procedures	85
	Packaging and Special Handling Procedures	88
	Quality Control and Nondestructive Inspection Procedures	90
	Procedures for Determining Number of Spare Parts	92
	Maintenance Effort	93
V	CONCLUSIONS	95
APPENDIX A	- TABLE A-1, MASTER TRANSPARENCY SYSTEM LIST	97
APPENDIX B	- FIGURE B-1, T-39 RELIABILITY AND MAINTAINABILITY SUMMARY (RAM)	129
	REFERENCES	135

LIST OF ABBREVIATIONS

A/C	Aircraft
ACI	Analytical Condition Inspection
AEDC	Arnold Engineering Development Center
AFB	Air Force Base
AFFDL	Air Force Flight Dynamics Laboratory
AFH	Flight Hours (From AFM 66-1)
AFL	Number of Flights (From AFM 66-1)
AFLC	Air Force Logistics Command
AFM	Air Force Manual
AFM 66-1	Maintenance Management System
AFM 65-110	Standard Aerospace Vehicle and Equipment Inventory, Status, and Utilization Reporting
AFM 127-1	Accident/Incident Data
AFR	Air Force Regulation
AFSC	Air Force Systems Command
AFTO	Air Force Technical Order
ALC	Air Logistics Center
AMS	Avionics Maintenance Squadron
ASTM	American Society for Testing and Materials
AT	Action Taken
ATF/LCA	Aircraft Transparency Failure and Logistics Cost Analysis
BLIS	Base Level Inquiry System
CON-C	Condemnation Costs
CRC	Cost Reduction Curve
DCM	Deputy Commander - Maintenance
DDCC	Delaminations, Deterioration, Cracks, and Chipping
D056	Product Performance System
D062	Spares Requirement System
DS	Distribution and Supply
EUMR	Emergency Unsatisfactory Materiel Report
FE	Vehicle Equipment Division
FER	Recovery and Crew Station Branch
FH	Flight Hours

FMC	Field Maintenance Cost
FMEA	Failure Modes and Effect Analysis
FMS	Field Maintenance Squadron
FSN	Federal Stock Number
HDP	Hydropress Die
HM, How Mal	How Malfunction
HTF	Heat Treat Fixture
IN	Information Office
INS	Inches
IROS	Increased Reliability of Operational Systems
KFH	Flight Hours (From K051)
KFL	Number of Flights (From K051)
K051	Logistical Support Cost (IROS)
(L)	Left-Hand Side
LAD	Los Angeles Division (Rockwell International)
LB	Pounds
LCC	Life Cycle Cost
LG	Laminated Glass
(L/R)	Left- and Right-Hand Sides
LRU	Line Replaceable Unit
LSC	Logistical Support Cost
MA	Maintenance
MAM	Maintenance Analysis Model Program
MDCS	Maintenance Data Collection System (AFM 66-1)
MDR	Maintenance Demand Rate
MIPS	Material Improvement Projects
MM	Material Management
MMH	Maintenance Man-Hours
MMH/FH	Maintenance Man-Hours per Flight Hour
MMH/MA	Maintenance Man-Hours per Maintenance Action
MTBF	Mean Time Between Failures
MTBMA	Mean Time Between Maintenance Action
MTBR	Mean Time Between Removal

MTBUR	Mean Time Between Unscheduled Removal
MTSL	Master Transparency System List
MU	Wavelength - Millimicrons
NDI	Nondestructive Inspection
NO. (#)	Number
NOC	Not Otherwise Coded
NORM	Not Operationally Ready - Maintenance
NORS	Not Operationally Ready - Supply
NRTS	Not Repairable This Station
NSN	National Stock Number
NTIS	National Technical Information Service
OAFB	Operational Air Force Base
OMS	Organizational Maintenance Squadron
PC	Polycarbonate
P/C	Pilot and Copilot
PDM	Programed Depot Maintenance
P/FFLABORT	Primary Failure Discovered After Flight Abort
P/FGRABORT	Primary Failure Discovered After Ground Abort
PFP	Production Flat Pattern
POMO	Production Oriented Maintenance Organization
PP	Procurement and Production
PPG	Pittsburg Plate Glass Industries
PSC	Packaging and Shipping Costs
PVB	Polyvinyl Butaryl
Q/C	Quality Control
(R)	Right-Hand Side
RAM	Reliability and Maintainability Program
RI/LAD	Rockwell International/Los Angeles Division
ROK	Recheck OK
R&R	Repair and Reclamation
RRS	Repair and Reclamation Shop
SA	Stretched Acrylic
SRC	Specialized Repair Costs

SRD	Steel Rule Die
TCTO	Technical Compliance Technical Order
TO	Technical Order
TT	Task Time
UCLA	University of California at Los Angeles
UMA	Unscheduled Maintenance Actions
USAF	United States Air Force
WBS	Work Breakdown Structure
W/S	Windshield
WUC	Work Unit Code

ALCS	Air Logistic Centers
OC-ALC	Oklahoma City ALC, Tinker Air Force Base, Oklahoma
OO-ALC	Ogden ALC, Hill Air Force Base, Utah
SA-ALC	San Antonio ALC, Kelly Air Force Base, Texas
SM-ALC	Sacramento ALC, McClellan Air Force Base, California
WR-ALC	Warner Robins ALC, Warner Robins Air Force Base, Georgia

The analysis was carried out in two steps. The first step was to deter-

SECTION I

INTRODUCTION

The primary objective of this program is to identify design improvements of transparency systems that will reduce the Air Force Logistic Command's cost of ownership. The approach utilized to effect this goal was to make a survey of the maintenance and installation procedures of 20 selected aircraft (figure 1) currently being used at the five air logistics centers and eight selected Air Force operational bases. From the data collected and evaluated, five design improvements resulting in cost reduction were developed.

This program is an extension of two previous programs (references 1 and 2) that were conducted to study failure modes, maintenance procedures, and the associated logistical support costs for transparency systems. The extent of the analysis developed in these previous studies was to search historical maintenance and logistical cost records, and categorize the physical transparency characteristics, failure modes, frequency of failures, and costs in a readily identifiable and inclusive statement of the problem.

The intent of this study is to expand the research of the transparency problems in greater depth, identify and recommend changes in maintenance procedures, and recommend design improvements that will reduce failures and cost of maintenance.

The definition of transparency systems, as considered in this study, is listed in figure 2. They include three categories:

1. Transparency components
2. Interactive support systems
3. Support structures

The transparencies were divided into the following

The transparency components consist of the primary elements of windshield panel assemblies, canopy transparency and frame assemblies, and cabin windows. The interactive support systems include only the major components of the subsystem. For example, sensors, bus bars, controllers, and toggle switches for anti-icing systems; integral and adjacent ducts, diffusers and control valves for defogging; actuators, links, and latches are included. Ancillary items such as wiring, switches, tubing, etc, are not included. Support structure considers only those members that form an edge member, adjacent contact with edge member, or part of a frame assembly.

Included within the tables is the tabulation of the error in the equation

BOMBERS
- B-52, B-57, AND FB-111

ATTACK
- A-7D AND A-37

CARGO/TRANSPORT
- C-5, C-9, C-130, C/KC-135, AND C-141

FIGHTERS
- F-4, F-15, F-105, AND F-111

TRAINERS
- T-37, T-38, AND T-39

OBSERVATION/UTILITY
- O-2 AND OV-10

HELICOPTERS
- CH-3, CH-53, AND UH-1

Figure 1. Study Aircraft

COMPONENTS

1. WINDSHIELDS
2. CANOPIES
3. WINDOWS

INTERACTIVE SUPPORT SYSTEMS

1. ANTI-ICING
2. DEFOGGING
3. RAIN REMOVAL
4. OPERATING AND ACTUATION
5. PRESSURIZATION

SUPPORT STRUCTURES

1. FRAMES
2. POSTS
3. LONGERONS & SILLS

Figure 2. Aircraft Transparency Systems

SECTION II

TASK III - TRANSPARENCY ANALYSIS

EVALUATION PROCESS

The normal approach utilized in a maintenance-type study is to conduct a reliability-type analysis that is keyed to frequency of failures with interactive review of maintainability, logistics, and cost. In view of the Air Force's demonstrated concern for cost, this program focuses on the identification of high-cost contributors with interactive review of maintainability, reliability (frequency of failures), and logistics. The end results of both approaches are essentially the same. However, the selected approach will result in a quicker identification of problems for achieving the stated objectives.

Figure 3 diagrams the steps utilized in developing a detailed failure analysis and identification of candidate improvements. Logistical support cost (K051) ranked by work unit code, is inserted into the maintainability analysis model (MAM) program, see figure 4. At the same time, maintenance data from AFM 66-1, Maintenance Data Collection System (MDCS) (reference 7), are inputed into the MAM's program. The output results in a tabulation of how-malfunctioned, when discovered, action taken, maintenance man-hours, flight hours, and logistical costs for each selected work unit code. Figures 5 and 6 are sample pages of the printout format of the maintenance actions and various parameters used to identify and determine failure modes. The MAM's printout will vary from 30 to 200 pages of printout, depending on the complexity of the transparency configuration.

When failure modes as extracted from MDCS of AFM 66-1 are inadequate, alternate data sources from field audit trip notes and collected reference material are used to supplement the analysis, and it is from this array of data that candidate items are established.

CANDIDATE IMPROVEMENT SELECTION CRITERIA

The decision to proceed with a cost trade study, or to document and file the study results, is determined by the following considerations:

1. Study aircraft will be in Air Force for at least 10 more years.

2. Design improvement will achieve substantial reduction in annual logistical support costs.

3. Design improvement will pay for itself within 3 years of implementation (goal).

4. Design improvement will achieve a significant saving in life-cycle cost over a 10-year period.

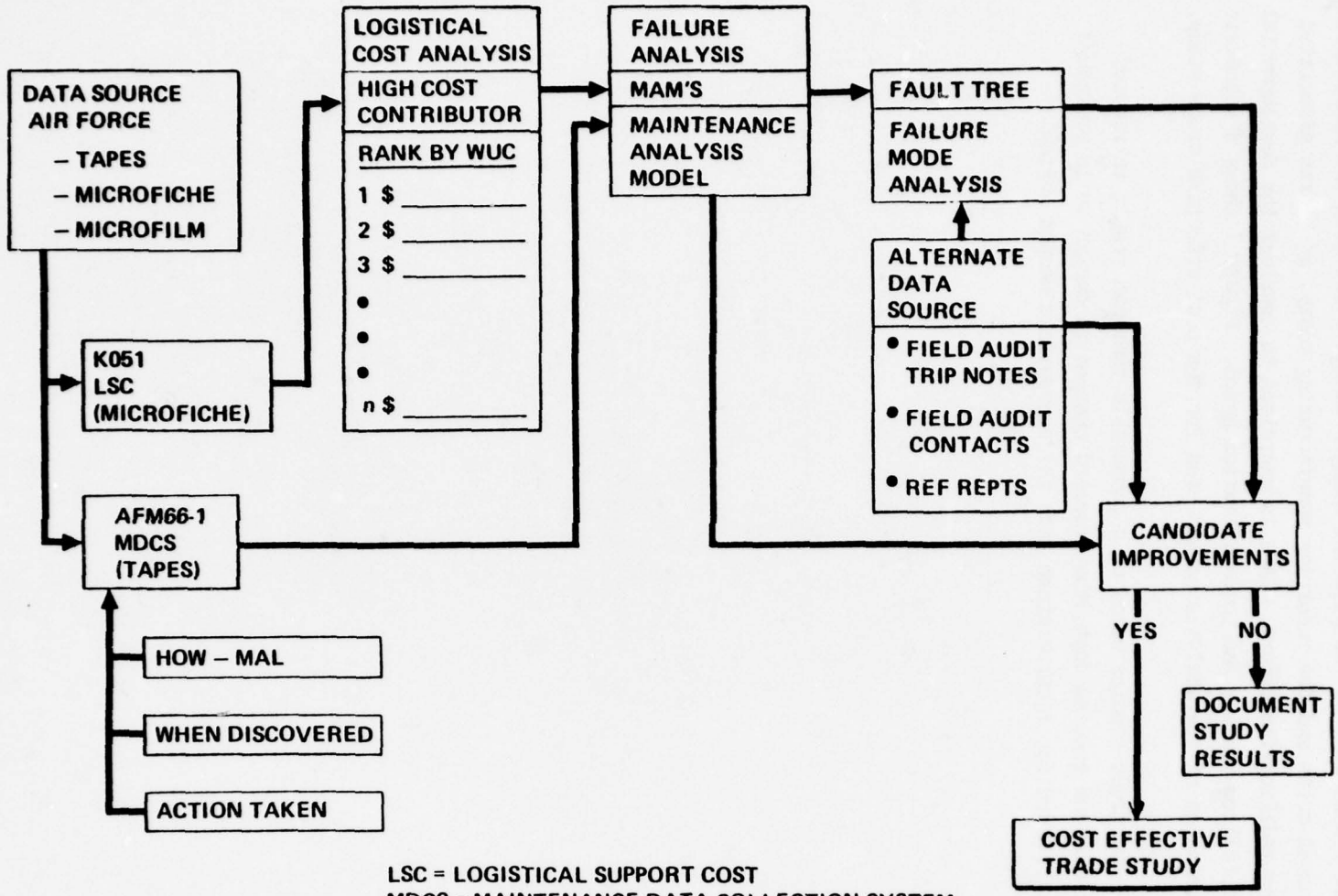
If one or more of items 2 through 4 appear to be achievable, a trade study will be implemented to ascertain the estimated cost saving of the proposed changes.

COST-EFFECTIVE TRADE STUDY

Having determined the candidate improvements, the task of meeting the selection criteria must be verified. In order to ensure that the proposed changes are viable, a cost comparison representing the existing maintenance effort and the cost estimated for the revised concepts or approaches are made. The current costs and procedures must be carefully examined to factor inflationary cost increases, aircraft attrition rates, and to correct discrepant inputs that inadvertently find their way into the maintenance tracking system. This was accomplished by correlating both the collected field audit data and the information gained through verification calls with field audit contacts, with the AFM 66-1 data.

The assessments of the proposed changes accounts for both the nonrecurring development costs and the recurring manufacturing costs, ar costs associated with the modification effort. Care is exercised to consider the developmental and specialized testing and requalification noted. Figure 7 shows a schematic representation of the analysis method used for the cost-effective trade study.

If the trade studies based on a comparable timespan result in reduced maintenance and reduced cost, the proposed changes in design or in procedure are recommended for incorporation into the appropriate weapon system.



LSC = LOGISTICAL SUPPORT COST
MDCS = MAINTENANCE DATA COLLECTION SYSTEM

Figure 3. Evaluation Process

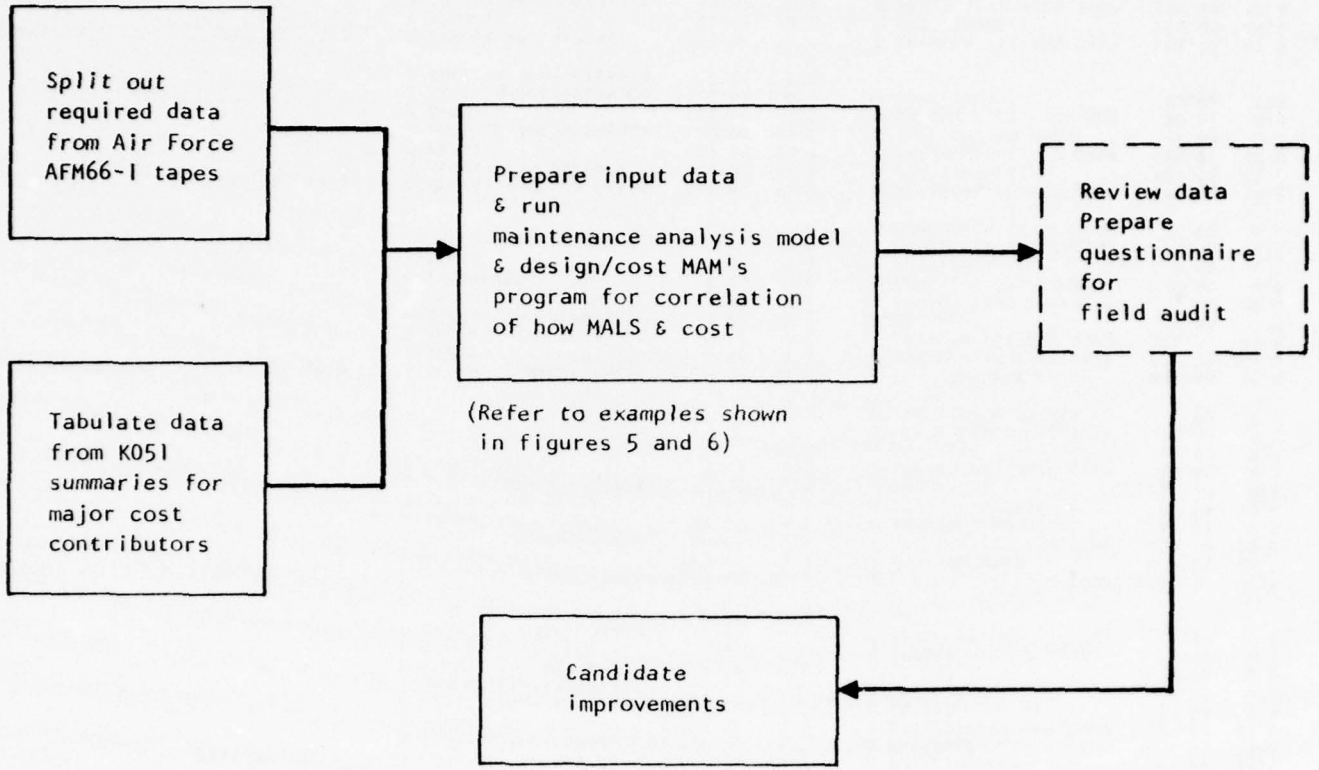


Figure 4. Failure Analysis Maintenance Analysis Model (MAMS)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 7

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING $86,490 LSC/YEAR | PCT OF LSC 10.17 TOTAL | LSC RNK 2 | 12115.08 MAN HRS | PCT OF MHR 9.93 TOTAL | MHR RNK 3 | 42.6892 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	2924.71	24.1	H EQUIP CK NO RPR RQRD	1751.75	59.9	H POST/THRUFLT	1589.63	54.4
			X TEST-INSPECT-SERVICE	721.58	24.7	M PERIODIC/PHASED INSP	979.95	33.5
			Q INSTALLED	384.18	13.1	F BETWEEN FLT GND CREW	322.74	11.0
			U RPLCD AFTER CANBLZTN	30.00	1.0	D INFLIGHT NO ABORT	12.50	0.4
			T REMOVE FOR CANIBLZTN	19.10	0.7	J PREFLIGHT	8.90	0.3
			R REMOVE AND REPLACE	9.60	0.3	R QC CHECK	8.00	0.3
			L ADJUST	6.00	0.2	B BEFORE FLT NO ABORT	3.00	0.1
			G RPR/RPLT MINOR PARTS	2.00	0.1	E AFTER FLIGHT	1.00	0.0
			P REMOVED	0.50	0.0			
105 LOOSE/DMGD BOLTS,NUT	2184.31	18.1	G RPR/RPLT MINOR PARTS	1969.45	90.6	M PERIODIC/PHASED INSP	1111.86	50.8
			F REPAIR	119.45	5.5	H POST/THRUFLT	579.55	26.5
			A BNCH CK AND REPAIRED	54.81	2.5	F BETWEEN FLT GND CREW	360.78	16.5
			L ADJUST	37.20	1.7	D INFLIGHT NO ABORT	55.01	2.5
			R REMOVE AND REPLACE	4.00	0.2	W IN-SHOP REPAIR	22.00	1.0
			X TEST-INSPECT-SERVICE	2.40	0.1	J PREFLIGHT	20.14	0.9
			Y TROUBLESHOOT	1.00	0.0	4 CORROSION CONTR INSP	18.00	0.8
						R QC CHECK	14.97	0.7
						S DEPOT LEVEL MAINTNCE	5.00	0.2
						P FUNCTIONAL CK FLT	1.00	0.0
108 MISSING BOLTS,NUTS..	1276.71	10.5	G RPR/RPLT MINOR PARTS	1128.09	88.4	H POST/THRUFLT	597.90	46.8
			F REPAIR	106.48	8.3	M PERIODIC/PHASED INSP	377.74	29.6
			A BNCH CK AND REPAIRED	36.51	2.9	F BETWEEN FLT GND CREW	285.77	22.4
			R REMOVE AND REPLACE	4.00	0.3	R QC CHECK	6.30	0.5
			L ADJUST	0.83	0.1	X ENGINE TEST STAND OP	4.00	0.3
			Q INSTALLED	0.50	0.0	N GROUND ALERT-DEGRAD	2.00	0.2
			Y CLEAN	0.30	0.0	J PREFLIGHT	1.00	0.1
						T SCHEDULED CALIBRZTN	1.00	0.1
						4 CORROSION CONTR INSP	1.00	0.1
199 CRACKED	1253.45	10.3	G RPR/RPLT MINOR PARTS	531.60	42.4	M PERIODIC/PHASED INSP	561.04	44.8
			R REMOVE AND REPLACE	346.99	27.7	H POST/THRUFLT	302.13	24.1
			F REPAIR	181.15	14.5	F BETWEEN FLT GND CREW	295.77	23.6
			A BNCH CK AND REPAIRED	163.05	13.0	D INFLIGHT NO ABORT	41.80	3.3
			P REMOVED	25.50	2.0	G GROUND ALERT-NOT DGR	36.01	2.9
			X TEST-INSPECT-SERVICE	5.00	0.4	J PREFLIGHT	16.70	1.3
			C BNCH CK-RPR DEFERRED	0.17	0.0			
849 DELAMINATED	703.22	5.8	R REMOVE AND REPLACE	520.60	74.0	F BETWEEN FLT GND CREW	294.72	41.9
			P REMOVED	92.51	13.2	H POST/THRUFLT	275.62	39.2
			X TEST-INSPECT-SERVICE	69.41	9.9	M PERIODIC/PHASED INSP	132.88	18.9
			G RPR/RPLT MINOR PARTS	15.10	2.1			
			A BNCH CK AND REPAIRED	5.00	0.7			
			J CLBRTD-NO ADJMT RQRD	0.60	0.1			
910 CHIPPED	478.98	4.0	R REMOVE AND REPLACE	410.84	85.8	H POST/THRUFLT	202.43	42.3

Figure 5. Sample Design Cost MAMS

MAINTENANCE ANALYSIS MODEL MAR. 21 1978

C/KC-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3
OPERATING HOURS 283930.0 NUMBER OF FLIGHTS FLOWN 179705.0

WUC	HOW MALFUNCTION	WHEN DISCOVERED	ACTION TAKEN		UNITS	MAINTENANCE MAN HOURS	MAINTENANCE DEMAND RATE/ 1000 FLT HRS	MEAN MAN HOURS/UNIT	MEAN MAN HOURS/ 1000 FLIGHT HOUR
1114A	010	M	R		2	3.67	0.00704	1.83	0.01292
	020	F	A		12	11.20	0.04226	0.93	0.03945
			F		1	1.40	0.00352	1.40	0.00493
			G		7	9.17	0.02465	1.31	0.03229
		TOTAL F			20	21.77	0.07044	1.09	0.07667
		H	F		2	36.01	0.00704	18.00	0.12682
			G		5	4.10	0.01761	0.82	0.01444
		TOTAL H			7	40.11	0.02465	5.73	0.14126
		M	A		3	23.00	0.01057	7.67	0.08102
			F		1	4.00	0.00352	4.00	0.01409
			G		21	55.04	0.07396	2.62	0.19386
			Q		1	1.50	0.00352	1.50	0.00528
			R		2	12.00	0.00704	6.00	0.04227
		TOTAL M			28	95.55	0.09862	3.41	0.33651
			ACTION TAKEN CODE SUMMARY						
			A		15	34.20	0.05283	2.28	0.12046
			F		4	41.41	0.01409	10.35	0.14584
			G		33	68.31	0.11623	2.07	0.24059
			Q		1	1.50	0.00352	1.50	0.00528
			R		2	12.00	0.00704	6.00	0.04227
	TOTAL 020				55	157.42	0.19371	2.86	0.55444
	070	C	G		1	0.50	0.00352	0.50	0.00176
		F	A		5	13.50	0.01761	2.70	0.04755
			C		2	1.00	0.00704	0.50	0.00352
			F		8	32.01	0.02818	4.00	0.11272
			G		27	63.01	0.09509	2.33	0.22191
			R		0	3.00	0.0	0.0	0.01057
		TOTAL F			42	112.51	0.14792	2.68	0.39627
		H	A		6	19.00	0.02113	3.17	0.06692
			F		4	31.20	0.01409	7.80	0.10990
			G		58	112.81	0.20428	1.95	0.39733
			R		13	15.00	0.04579	1.15	0.05284
			X		2	1.00	0.00704	0.50	0.00352
		TOTAL H			83	179.02	0.29233	2.16	0.63051
		J	F		1	2.30	0.00352	2.30	0.00810
			G		6	4.00	0.02113	0.67	0.01409
		TOTAL J			7	6.30	0.02465	0.90	0.02219
		M	F		2	2.00	0.00704	1.00	0.00705
			G		65	85.41	0.22893	1.31	0.30082
			R		3	2.50	0.01057	0.83	0.00881
		TOTAL M			70	89.91	0.24654	1.28	0.31667
			ACTION TAKEN CODE SUMMARY						
			A		11	32.50	0.03874	2.95	0.11448
			C		2	1.00	0.00704	0.50	0.00352
			F		15	67.51	0.05283	4.50	0.23777
			G		157	265.73	0.55295	1.69	0.93590
			R		16	20.50	0.05635	1.28	0.07221
			X		2	1.00	0.00704	0.50	0.00352

Figure 6. Sample Maintenance Analysis Model (MAMS)

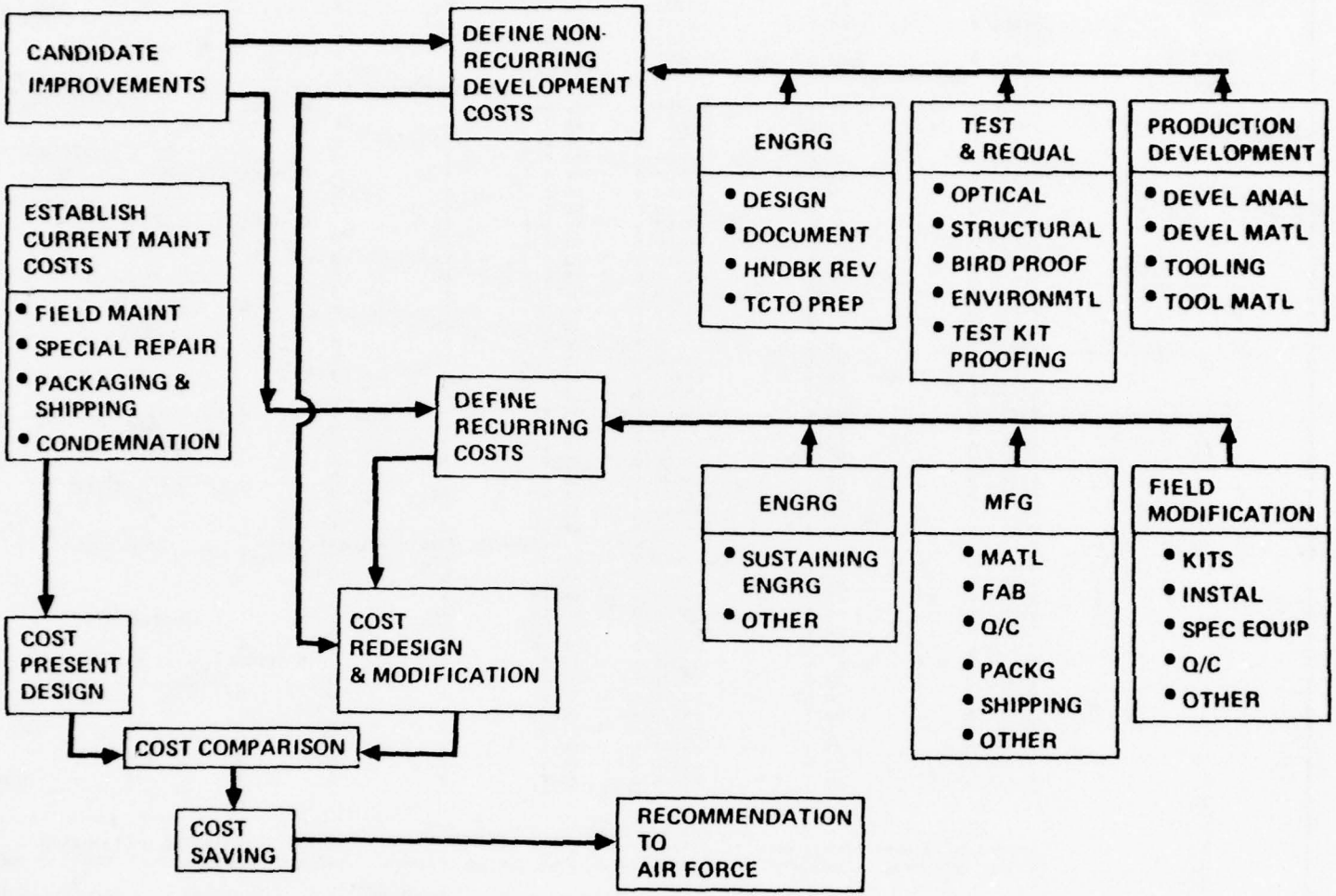


Figure 7. Cost-Effective Trade Study

SECTION III

DATA ANALYSIS

DATA ANALYSIS

Information on aircraft transparency types, missions, design characteristics, and environmental factors has been identified and categorized for the 20 selected aircraft. The associated reliability and maintainability cost data was collected and compared to these factors. The data has been reviewed and the primary contributors to logistic support cost identified and reviewed for potential cost-effective changes (reference Volume I, section II). The proposed changes that have resulted from this review are summarized in section IV.

An analysis was conducted to determine the correlation between logistics support costs, which are a function of the reliability and maintainability cost, and the aircraft design, operational and environmental parameters. In addition, equations were derived to estimate the logistics support cost in terms of these parameters. The analysis was carried out using stepwise regression techniques, and USAF K051 logistics support cost data and AFM 66-1 maintenance man-hour data for 20 operational Air Force aircraft.

The regression analysis was conducted using the UCLA Biomedical computer program entitled, "Stepwise Regression BMD02R" (reference 14). A complete description of the computer program is provided in the University of California publication in automatic computation No. 2, entitled, "Biomedical Computer Programs."

Reference 14. W. J. Dixon, "Biomedical Computer Programs - University of California Publications in Automatic Computation," BMD Number 2, Library of Congress Catalog Number: 72-98008, University of California Press, Berkeley and Los Angeles California, Third Edition 1973, Second Printing 1974

The analysis was carried out in two steps. The first step was to determine correlations and equations for the different types of transparencies using all the data. The second step was to limit the analysis to the design data and operational data which would normally be available during the conceptual phase of design.

DEVELOPMENT OF DATA FOR ANALYSIS

Logistics support costs, flight hours and number of flights were extracted from USAF K051 tabulations for the period July 1976 through June 1977. AFM 66-1 maintenance data for the period January 1976 through June 1977 were utilized to determine man-hours. The environmental parameters were average values computed from Air Force data (reference 15) considering the operational base for each type of aircraft. Aircraft and transparency parameters were derived from Air Force documents. The parameters used in the analysis are shown as the headings in tables 1, 2, and 3.

GENERAL CORRELATION

Four different logistics support cost parameters were examined:

1. Logistics support dollars per flight hour
2. Maintenance man-hours per flight hour
3. Logistics support dollars per year per aircraft
4. Maintenance man-hours per 1.5 years per aircraft

Reference 15. J. C. Sims, 1Lt., USAF, "Climatic Data," AFSC Letter - WE, Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, OH 45433, 17 January 1978

The transparencies were divided into the following categories for the analysis:

1. Canopies

2. Windshields

3. Windshields and other cockpit windows

The correlation between the logistics support cost (LSC) parameters and the data parameters is shown in tables 1, 2, 3, and 4. The data that have the strongest correlation to the LSC parameters are circled in tables 1, 2, and 3 and listed in table 4. The parameter with the strongest correlation is always the first variable used in deriving the regression equations. Table 4 shows that the aircraft design parameters had the strongest correlation to logistics support cost and man-hours in eight of the twelve cases evaluated. There were two cases where the transparency weight had the strongest correlation.

EQUATION FOR ESTIMATING LSC DURING THE CONCEPTUAL PHASE

One of the objectives of this analysis was to derive equations that could be used during the conceptual design phase for estimating LSC parameters. Since base environmental parameters are usually not known during the conceptual phase, they were excluded from the equations.

The equations that resulted from the analysis are shown in tables 5 through 7. A typical example of the equation derived is the equation for logistic support cost per flight hour for canopies (table 5) which is equal to:

$$-19.46402 - 0.65119\ (\text{transparent area - in.}^2) + 13.85458\ (\text{number of transparent panels}) + 28.92589\ (\text{height of transparency from ground - ft}) - 0.17236\ (\text{cruise altitude - ft}) + 21.0433\ (\text{stall speed - knots}) - 2.34853\ (\text{landing distance - ft}) - 1.08204\ (\text{A/C gross weight - lb}) - 8.88644\ (\text{maximum G-loads}) - 1.05456\ (\text{flight hours per A/C per year})$$

Included within the tables is the tabulation of the error in the equation as a function of the variable entered in the equation and the residual error that occurred when the actual data are used in the equation. Canopies have the least residual when the transparency characteristics are computed using the original data.

The equations for maintenance man-hours produced a better correlation than the equations for logistic support costs. The parameter with the strongest correlation to the cost was cruise altitude which is the first variable entered in four of the equations followed by maximum G which was first in three of the equations.

The majority of the variables in the equation are aircraft design parameters such as cruise altitude. Most of the equations contain only one or two transparency design parameters such as transparency weight or area. As a result, the primary usefulness of the equation would be to estimate costs of man-hours for a conceptual aircraft. The equation would have only a limited application in estimating cost and man-hours for trading off candidate transparency configurations with changes in those parameters contained within the equations.

EQUATIONS DERIVED USING ALL DATA

Equations were also derived using all the parameters to estimate logistic support cost when base environmental parameters are available. The use of environmental parameters resulted in lower residual in most cases. The most significant improvement, the maintenance man-hour per aircraft for canopies, can be seen by comparing the residual in tables 8 through 10.

TABLE 1. TRANSPARENCY DESIGN AND OPERATIONAL PARAMETERS CORRELATION MATRIX

Reliab & maint cost parameters*	Transparency design parameters						Operational parameters			
	Area (7)	Weight (8)	Thickness (9)	No. of layers (10)	No. of panels (11)	Dist above grd (12)	AFM66-1 flt hr/A/C (57)	AFM66-1 flt/A/C (58)	KO-51 flt hr/A/C (59)	KO-51 flt/A/C (60)
Canopy										
LSC per flt hr (2)	-0.137	-0.320	-0.360	-0.188	-0.065	-0.010	-0.270	-0.152	-0.292	0.039
MMI per flt hr (4)	-0.070	-0.275	-0.320	-0.115	-0.040	0.091	-0.298	-0.306	0.167	-0.203
LSC per A/C (40)	-0.238	-0.390	-0.429	-0.240	-0.090	-0.125	-0.225	-0.083	0.399	0.118
MMI per A/C (48)	0.320	0.351	0.261	-0.235	-0.042	0.170	-0.208	-0.203	-0.210	-0.193
Windshield										
LSC per flt (7)	0.096	-0.098	-0.215	-0.155	0.243	0.009	-0.194	-0.130	-0.102	0.071
MMI per flt hr (4)	0.288	0.274	0.193	0.332	0.258	0.355	-0.161	(-0.382)	-0.156	-0.377
LSC per A/C (40)	0.157	0.085	-0.047	-0.034	0.276	0.112	-0.010	-0.021	0.096	0.164
MMI per A/C (48)	0.275	(0.724)	0.677	0.613	0.236	0.541	0.485	0.125	0.495	0.033
Windshield & cockpit										
LSC per flt (2)	0.185	0.033	-0.117	-0.105	0.185	0.125	-0.141	-0.141	-0.058	0.040
MMI per flt (4)	0.441	0.396	0.307	0.307	0.459	0.444	0.005	-0.244	-0.009	-0.276
LSC per A/C (40)	0.399	0.298	0.152	0.019	0.325	0.275	0.168	0.049	0.263	0.190
MMI per A/C	0.667	(0.737)	0.688	0.446	0.581	0.585	0.531	0.151	0.525	0.366

*LSC = logistic support cost, MMI = maintenance man-hours at field level, ( ) = identification number.

( ) Strongest correlation to LSC parameters

TABLE 2. AIRCRAFT DESIGN PARAMETERS CORRELATION MATRIX

Reliab & maint cost parameters*	Aircraft design parameters								
	Max g (26)	Max speed (18)	Max alt (19)	Cruise speed (20)	Cruise alt (21)	Takeoff dist (22)	Stall speed (23)	Landing dist (24)	Gross weight (25)
Canopy									
LSC per flt hr (2)	-0.367	-0.394	-0.448	-0.464	(-0.763)	-0.274	-0.276	-0.327	-0.313
MMH per flt hr (4)	0.334	-0.251	-0.363	-0.450	(-0.777)	-0.115	-0.196	-0.345	-0.088
LSC per A/C (40)	+0.309	-0.450	-0.475	-0.547	(-0.773)	-0.347	-0.391	-0.451	-0.348
MMH per A/C (48)	0.187	0.395	0.385	0.166	0.212	-0.476	0.058	-0.038	-0.057
Windshield									
LSC per flt hr (2)	-0.250	-0.218	-0.269	-0.328	(-0.360)	-0.235	-0.211	-0.289	-0.053
MMH per flt hr (4)	-0.220	0.083	0.087	0.137	0.018	0.359	0.228	0.057	0.329
LSC per A/C (40)	(-0.364)	-0.268	-0.246	-0.296	-0.298	-0.194	-0.241	-0.346	0.066
MMH per A/C (48)	-0.437	-0.068	0.178	0.269	0.276	0.410	0.104	-0.008	0.565
Windshield & cockpit									
LSC per flt hr (2)	(-0.373)	-0.252	-0.230	-0.274	-0.288	-0.094	-0.162	-0.256	0.097
MMH per flt hr (4)	-0.423	-0.054	0.114	0.188	0.165	(0.523)	0.224	0.085	0.510
LSC per A/C (40)	(-0.519)	-0.304	-0.176	-0.196	-0.173	-0.020	-0.186	-0.311	0.263
MMH per A/C	-0.549	-0.122	0.197	0.298	0.344	0.533	0.144	0.028	0.660

*LSC - logistic support cost, MMH = maintenance man-hours at field level, ( ) = identification number.

( ) Strongest correlation to LSC parameters

TABLE 3. BASE ENVIRONMENTAL CHARACTERISTICS CORRELATION MATRIX

Reliab & maint cost parameters*	Environmental characteristics									
	Base elev (27)	Ext max temp (28)	Ext min temp (29)	Mean max temp (30)	Mean min temp (31)	Max wind speed (32)	Mean wind speed (33)	Humidity at 400 (34)	Humidity at 1,300 (35)	Basemean precipitation (36)
Canopy										
LSC per flt hr (2)	-0.078	-0.333	-0.055	-0.215	-0.061	-0.291	-0.436	0.390	0.385	0.096
MMH per flt hr (4)	-0.172	-0.493	-0.080	-0.356	-0.169	-0.310	-0.332	0.470	0.510	0.157
LSC per A/C (40)	-0.133	-0.356	-0.136	-0.246	-0.095	-0.383	-0.458	0.450	0.443	0.106
MMH per A/C (48)	-0.329	0.301	0.321	0.189	0.303	(0.480)	0.335	0.002	0.088	0.062
Windshield										
LSC per flt hr (2)	-0.030	-0.019	0.223	0.159	0.168	-0.151	-0.229	-0.140	-0.057	0.149
MMH per flt hr (4)	-0.101	0.059	0.219	-0.060	-0.102	0.108	0.201	-0.070	0.109	-0.110
LSC per A/C (40)	-0.150	-0.001	0.305	0.124	0.135	-0.184	-0.082	-0.045	0.023	0.103
MMH per A/C (48)	-0.388	0.160	0.334	-0.117	-0.177	-0.007	0.539	0.197	0.235	-0.209
Windshield & cockpit										
LSC per flt hr (2)	-0.143	-0.040	0.264	0.130	0.149	-0.211	-0.223	-0.051	0.011	0.159
MMH per flt hr (4)	-0.249	-0.010	0.197	-0.098	-0.101	-0.071	0.100	0.165	0.211	-0.021
LSC per A/C (40)	-0.283	-0.031	0.391	0.075	0.110	-0.277	-0.019	0.098	0.109	0.109
MMH per A/C	-0.451	0.058	0.336	-0.140	-0.150	-0.176	0.373	0.334	0.271	-0.099

*LSC = logistic support cost, MMH = maintenance man-hours at field level, ( ) = identification number

(0.480) Strongest correlation to LSC parameters

TABLE 4. PARAMETERS WHICH HAVE STRONGEST CORRELATION TO LOGISTIC COST AND MAN-HOURS

Transparency categories	Aircraft design			Transparency design	Environmental	Operational
	Cruise altitude	Maximum g	Takeoff distance	Transparency weight	Maximum wind speed	Flights per aircraft
Canopies	3				1	
Windshields	1	1		1		1
Windshields & other cockpit windows		2	1	1		
Total	4	3	1	2	1	1

Parenthetic Notation for Tables 1 through 10.

(2) L$/KFH
(4) MH/FH
(7) Area $(in.^{-2})/100$
(8) Weight (lb)
(9) Thickness (in.)
(10) No Layers
(11) No Panels
(12) Height Above Ground (ft)
(17) No Aircraft
(18) Max Speed (kt)/100
(19) Max Alt (ft)/100
(20) Cruise Speed (kt)/100
(21) Cruise Alt (ft)/100
(22) T.O. Dist (ft)/100
(23) Stall Speed (kt)/100
(24) Ldg Dist (ft)/100
(25) Gross Wt (lb)/1,000
(26) Max (Lim) "G"
(27) Base Elevation (ft)/10
(28) Extreme Max Temp (°F)
(29) Extreme Min Temp (°F)
(30) Mean Max Temp (°F)
(31) Mean Min Temp (°F)
(32) Max Wind Speed (kt)
(33) Mean Wind Speed (kt)
(34) Humidity - 400 Ft (%)
(35) Humidity - 1,300 Ft (%)
(36) Mean Precipitation (in.)
(40) LSC/AC/100
(48) MHR/AC/10
(57) AFH/AC/100
(58) AFL/AC/100
(59) KFH/AC/100
(60) KFL/AC/100

TABLE 5. ESTIMATED CANOPY LSC EQUATIONS FOR CONCEPTUAL PHASE

MAINTENANCE MAN-HOURS
PER FLIGHT HOURS

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	6.83711
LAYERS 10	-1.85801
HEIGHT 12	11.75690
MX ALT 19	-0.02904
CR ALT 21	-0.09664
STL SP 23	3.33321
LD DST 24	-1.07913
GRS WT 25	-0.20967
MAX G 26	-1.58299
KFL/AC 60	-0.03383

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	CR ALT 21		0.7775	0.6045
2	HEIGHT 12		0.9214	0.8489
3	LD DST 24		0.9661	0.9334
4	GRS WT 25		0.9904	0.9809
5	MX ALT 19		0.9974	0.9948
6	MAX G 26		0.9988	0.9977
7	LAYERS 10		0.9998	0.9996
8	STL SP 23		1.0000	1.0000
9	KFL/AC 60		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	21.6600	21.6540	0.0060
2	2.9800	2.9818	-0.0018
3	0.4700	0.4698	0.0002
4	9.6300	9.6313	-0.0013
5	6.7400	6.7437	-0.0037
6	2.2900	2.2894	0.0006
7	18.8700	18.8685	0.0015
8	16.9900	16.9889	0.0011
9	1.9200	1.9164	0.0036
10	1.6400	1.6428	-0.0028
11	54.0100	54.0123	-0.0023

LOGISTIC SUPPORT COST
PER FLIGHT HOUR

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	-19.46402
AREA 7	-0.65119
PANELS 11	13.85458
HEIGHT 12	28.92589
CR ALT 21	-0.17236
STL SP 23	21.04333
LD DST 24	-2.34853
GRS WT 25	-1.08204
MAX G 26	-8.88644
KFH/AC 59	-1.05456

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	CR ALT 21		0.7630	0.5822
2	HEIGHT 12		0.8500	0.7225
3	KFH/AC 59		0.8964	0.8036
4	GRS WT 25		0.9389	0.8814
5	LD DST 24		0.9630	0.9274
6	MAX G 26		0.9834	0.9672
7	STL SP 23		0.9901	0.9803
8	AREA 7		0.9943	0.9886
9	PANELS 11		1.0000	0.9999

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	35.1350	35.2662	-0.1312
2	3.0980	3.2327	-0.1347
3	0.6090	1.0920	-0.4830
4	10.2900	10.0219	0.2681
5	10.3460	10.2818	0.0642
6	3.7480	3.3242	0.4238
7	26.9350	27.0659	-0.1310
8	11.6740	11.8100	-0.1360
9	5.5510	5.3775	0.1735
10	22.9940	22.9429	0.0511
11	99.6680	99.6283	0.0397

TABLE 5. ESTIMATED CANOPY LSC EQUATIONS FOR CONCEPTUAL PHASE (CONCL)

MAINTENANCE MAN-HOURS
PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	7.18347
AREA 7	0.04972
THKNES 9	-1.96083
LAYERS 10	3.69617
PANELS 11	-4.54726
MX SPD 18	0.67532
TODIST 22	-0.06155
LD DST 24	-0.12725
GRS WT 25	-0.06545
KFL/AC 60	-0.12088

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	TODIST 22		0.4761	0.2267
2	MX SPD 18		0.7325	0.5366
3	PANELS 11		0.7934	0.6294
4	LAYERS 10		0.9153	0.8378
5	KFL/AC 60		0.9439	0.8910
6	AREA 7		0.9567	0.9152
7	LD DST 24		0.9912	0.9825
8	GRS WT 25		0.9988	0.9976
9	THKNES 9		1.0000	0.9999

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	0.9082	0.9142	-0.0060
2	0.0978	0.1054	-0.0076
3	0.0237	0.0165	0.0072
4	0.3516	0.3528	-0.0012
5	0.2220	0.2220	-0.0000
6	6.4805	6.4826	-0.0021
7	0.5524	0.5584	-0.0060
8	0.5070	0.5052	0.0018
9	0.1296	0.1594	-0.0298
10	0.0487	0.0216	0.0271
11	1.6506	1.6339	0.0167

LOGISTIC SUPPORT COST
PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	-1.64384
AREA 7	-0.02228
HEIGHT 12	1.32504
MX ALT 19	-0.00929
CR SPD 20	-0.62928
CR ALT 21	0.00163
TODIST 22	-0.05914
MAX G 26	-0.25274
KFH/AC 59	0.92783
KFL/AC 60	-0.08255

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	CR ALT 21		0.7726	0.5969
2	HEIGHT 12		0.8122	0.6596
3	KFH/AC 59		0.8793	0.7732
4	TODIST 22		0.9232	0.8522
5	MX ALT 19		0.9422	0.8878
6	KFL/AC 60		0.9679	0.9369
7	MAX G 26		0.9862	0.9726
8	AREA 7		0.9958	0.9916
9	CR SPD 20		1.0000	0.9999

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	0.9835	0.9953	-0.0118
2	0.0730	0.0657	0.0073
3	0.0205	0.0359	-0.0154
4	0.2898	0.2825	0.0073
5	0.1936	0.1981	-0.0045
6	0.0891	0.0920	0.0029
7	0.5236	0.5206	0.0030
8	0.3970	0.3833	0.0138
9	0.2547	0.2597	-0.0050
10	0.9142	0.9052	0.0090
11	4.0167	4.0174	-0.0007

TABLE 6. ESTIMATED WINDSHIELD LSC EQUATIONS FOR CONCEPTUAL PHASE

LOGISTIC SUPPORT COST PER FLIGHT HOUR

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		-441.55688
AREA	7	2.61744
WEIGHT	8	-1.18475
THKNES	9	-163.99594
PANELS	11	61.93144
HEIGHT	12	45.51576
MX SPD	18	-42.78380
MX ALT	19	1.09485
TODIST	22	-6.61372
STL SP	23	299.99976
LD DST	24	-2.83864
GRS WT	25	-0.63872
MAX G	26	-27.95491
KFH/AC	59	12.20114
KFL/AC	60	-13.27926

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	CR ALT 21		0.3596	0.1293
2	MAX G 26		0.4122	0.1699
3	MX ALT 19		0.4564	0.2083
4	THKNES 9		0.4907	0.2408
5	PANELS 11		0.5269	0.2777
6	TODIST 22		0.5876	0.3452
7	HEIGHT 12		0.6322	0.3997
8		CR ALT 21	0.6321	0.3995
9	GRS WT 25		0.6479	0.4198
10	MX SPD 18		0.6611	0.4370
11	STL SP 23		0.6765	0.4576
12	KFL/AC 60		0.6884	0.4738
13	LD DST 24		0.6957	0.4840
14	WEIGHT 8		0.7072	0.5001
15	AREA 7		0.7103	0.5046
16	KFH/AC 59		0.7123	0.5074

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	80.7490	48.0933	32.6557
2	26.4220	-79.2246	105.6466
3	47.9420	57.6577	-9.7157
4	32.6380	109.7395	-77.1015
5	44.0650	128.9243	-84.8593
6	57.4640	62.9666	-5.5025
7	5.8050	14.9570	-9.1520
8	20.2280	154.0857	-133.8577
9	88.7840	-31.0513	119.8353
10	73.2360	59.3315	13.9044
11	71.5060	18.6113	52.8947
12	14.1280	22.2888	-8.1608
13	51.8450	39.2529	12.5921
14	43.2960	8.1082	35.1879
15	32.3830	45.4221	-13.0391
16	733.5029	416.5728	316.9302
17	48.1180	280.9094	-232.7914
18	26.6690	74.1934	-47.5244
19	7.0110	-12.8428	19.8538
20	6.6740	91.9250	-85.2510
21	26.7520	-24.9546	51.7066
22	18.5020	72.7739	-54.2719

TABLE 6. ESTIMATED WINDSHIELD LSC EQUATIONS FOR CONCEPTUAL PHASE (CONT)

MAINTENANCE MAN-HOURS PER FLIGHT HOUR

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		94.29761
AREA	7	-1.20487
WEIGHT	8	0.37964
THKNES	9	7.65678
LAYERS	10	6.31083
PANELS	11	17.05223
HEIGHT	12	-9.52310
MX SPD	18	5.43398
MX ALT	19	-0.12125
CR SPD	20	64.43761
CR ALT	21	-0.27658
TODIST	22	0.26023
STL SP	23	-15.59541
LD DST	24	-3.19364
GRS WT	25	0.10276
MAX G	26	-10.11339
KFH/AC	59	-15.99253
KFL/AC	60	4.09096

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	KFL/AC 60		0.3767	0.1419
2	MAX G 26		0.5060	0.2560
3	LAYERS 10		0.5525	0.3052
4	KFH/AC 59		0.5649	0.3191
5	CR SPD 20		0.5761	0.3318
6	LD DST 24		0.6574	0.4322
7	CR ALT 21		0.7304	0.5335
8	PANELS 11		0.7599	0.5775
9	MX ALT 19		0.7843	0.6151
10		KFL/AC 60	0.7843	0.6150
11	AREA 7		0.7914	0.6263
12	HEIGHT 12		0.7951	0.6322
13	WEIGHT 8		0.8404	0.7063
14	KFL/AC 60		0.8450	0.7141
15	MX SPD 18		0.8522	0.7262
16	GRS WT 25		0.8644	0.7472
17	STL SP 23		0.8663	0.7505
18	TODIST 22		0.8686	0.7544
19	THKNES 9		0.8690	0.7552

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	57.3400	62.5170	-5.1770
2	18.1800	5.1288	13.0512
3	24.5700	27.5043	-2.9342
4	23.1900	32.4480	-9.2580
5	28.9200	41.3057	-12.3857
6	51.5700	52.2620	-0.6920
7	3.4600	4.8204	-1.3604
8	12.7900	27.9677	-15.1777
9	100.8200	82.7852	18.0348
10	51.4600	50.1757	1.2843
11	53.4700	44.6770	8.7930
12	12.6100	16.9026	-4.2926
13	36.6700	31.4145	5.2555
14	53.7300	48.2904	5.4396
15	27.0900	39.6885	-12.5985
16	62.8700	29.1571	33.7129
17	38.5400	57.8882	-19.3482
18	18.2500	16.2708	1.9792
19	4.9100	0.9993	3.9107
20	0.5700	8.7931	-8.2231
21	24.8600	17.2589	7.6011
22	11.7100	19.3226	-7.6126

TABLE 6. ESTIMATED WINDSHIELD LSC EQUATIONS FOR CONCEPTUAL PHASE (CONT)

LOGISTIC SUPPORT COST PER AIRCRAFT

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		-14.27758
AREA	7	0.10939
WEIGHT	8	-0.02792
THKNES	9	-7.63863
LAYERS	10	0.48567
PANELS	11	2.05274
HEIGHT	12	1.41255
MX SPD	18	-1.71527
MX ALT	19	0.04051
CR SPD	20	1.48389
TODIST	22	-0.30398
STL SP	23	10.48630
LD DST	24	-0.13972
GRS WT	25	-0.01935
MAX G	26	-1.33619
KFH/AC	59	0.69639
KFL/AC	60	-0.70836

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	MAX G 26		0.3641	0.1326
2	TODIST 22		0.4568	0.2087
3	PANELS 11		0.5290	0.2799
4	STL SP 23		0.5863	0.3438
5	AREA 7		0.6036	0.3644
6	MX ALT 19		0.6134	0.3763
7	MX SPD 18		0.6369	0.4056
8	THKNES 9		0.6496	0.4220
9	HEIGHT 12		0.6753	0.4560
10	GRS WT 25		0.6949	0.4829
11	LD DST 24		0.7080	0.5013
12	KFL/AC 60		0.7158	0.5124
13	WEIGHT 8		0.7186	0.5164
14	KFH/AC 59		0.7234	0.5233
15	CR SPD 20		0.7252	0.5259
16	LAYERS 10		0.7259	0.5269

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	2.2602	1.5837	0.6766
2	0.6224	-3.0974	3.7198
3	2.0165	2.6885	-0.6720
4	1.0997	3.6773	-2.5776
5	1.2411	3.5793	-2.3382
6	3.7909	4.0778	-0.2869
7	0.7817	1.2120	-0.4304
8	1.0665	5.9135	-4.8470
9	3.0021	-1.4403	4.4424
10	8.5723	7.4033	1.1691
11	1.3383	-0.2604	1.5988
12	0.3356	0.6873	-0.3517
13	1.0078	-0.0396	1.0474
14	1.4725	1.0334	0.4391
15	1.1824	1.5914	-0.4090
16	25.8619	14.6408	11.2211
17	1.5082	10.1653	-8.6571
18	0.8510	2.5230	-1.6721
19	0.3218	-0.9944	1.3162
20	0.2653	3.2777	-3.0123
21	2.8500	1.6204	1.2296
22	0.7457	2.3514	-1.6057

TABLE 6. ESTIMATED WINDSHIELD LSC EQUATIONS FOR CONCEPTUAL PHASE (CONCL)

MAINTENANCE MAN-HOURS PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	8.14964)
AREA 7	-0.07908
WEIGHT 8	0.03887
THKNES 9	-1.27592
LAYERS 10	0.88374
PANELS 11	0.22830
HEIGHT 12	-0.72017
MX SPD 18	0.19431
MX ALT 19	-0.00485
CR SPD 20	4.07690
CR ALT 21	-0.01499
TODIST 22	-0.02948
STL SP 23	-1.95039
LD OST 24	-0.12902
GRS WT 25	0.00716
MAX G 26	-0.84295
KFH/AC 59	-0.47572

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	WEIGHT 8		0.7237	0.5238
2	HEIGHT 12		0.7530	0.5669
3	MAX G 26		0.7801	0.6085
4	CR SPD 20		0.8221	0.6759
5	KFH/AC 59		0.8423	0.7095
6	LD OST 24		0.8731	0.7624
7	CR ALT 21		0.9057	0.8202
8	STL SP 23		0.9188	0.8441
9	TODIST 22		0.9261	0.8576
10	LAYERS 10		0.9310	0.8667
11	AREA 7		0.9358	0.8758
12	GRS WT 25		0.9384	0.8805
13	MX ALT 19		0.9397	0.8829
14	MX SPD 18		0.9419	0.8871
15	THKNES 9		0.9441	0.8913
16	PANELS 11		0.9452	0.8934

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	2.4041	2.8580	-0.4539
2	0.5948	0.0197	0.5751
3	1.5415	2.1627	-0.6212
4	1.2079	1.1787	0.0292
5	1.0581	0.8250	0.2331
6	4.4971	4.5280	-0.0309
7	0.7167	0.9583	-0.2417
8	0.9202	1.9869	-1.0668
9	4.7948	3.8691	0.9257
10	8.3537	7.4276	0.9260
11	1.7616	1.6968	0.0648
12	0.3562	0.5302	-0.1740
13	1.0731	0.3765	0.6966
14	1.6026	2.3266	-0.7240
15	1.4314	1.8435	-0.4122
16	1.3338	0.0509	1.2828
17	0.7182	1.6931	-0.9749
18	0.8753	0.9543	-0.0790
19	0.3321	-0.4454	0.7775
20	0.0168	0.3357	-0.3188
21	3.6862	3.9968	-0.3106
22	0.3578	0.4605	-0.1027

TABLE 7. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR CONCEPTUAL PHASE

LOGISTIC SUPPORT COST PER FLIGHT HOUR

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	-598.79785
AREA 7	1.67382
WEIGHT 8	-1.28973
LAYERS 10	-69.59607
PANELS 11	12.24913
HEIGHT 12	60.95209
MX SPD 18	-59.29915
MX ALT 19	1.61212
CR SPD 20	-124.81027
TODIST 22	-3.96576
STL SP 23	620.11060
LD DST 24	-3.70940
GRS WT 25	-0.99031
MAX G 26	-12.25292
KFH/AC 59	24.68611
KFL/AC 60	-15.89670

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	MAX G 26		0.3730	0.1391
2	KFH/AC 59		0.4470	0.1998
3	CR ALT 21		0.4770	0.2275
4	MX ALT 19		0.5070	0.2570
5	KFL/AC 60		0.5363	0.2876
6	STL SP 23		0.5586	0.3120
7	MX SPD 18		0.5751	0.3307
8	TODIST 22		0.6182	0.3821
9	LD DST 24		0.6261	0.3920
10	HEIGHT 12		0.6349	0.4031
11	GRS WT 25		0.6655	0.4429
12	WEIGHT 8		0.6844	0.4684
13	CR SPD 20		0.6955	0.4838
14		CR ALT 21	0.6954	0.4836
15	LAYERS 10		0.7057	0.4980
16	PANELS 11		0.7214	0.5204
17	AREA 7		0.7227	0.5223

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	80.7490	49.7849	30.9641
2	26.4220	-68.6821	95.1041
3	159.6260	175.7649	-16.1389
4	32.6380	113.9326	-81.2946
5	44.0650	127.5879	-83.5229
6	91.3460	121.8176	-30.4716
7	25.6340	29.4492	-3.8152
8	66.7760	173.1482	-106.3722
9	222.4700	83.6238	138.8462
10	118.2310	70.3877	47.8433
11	71.5060	-47.3574	118.8634
12	14.1280	47.4165	-33.2885
13	51.8450	48.8018	3.0432
14	43.2960	18.6985	24.5975
15	32.3830	14.6826	17.7004
16	740.0271	437.4773	302.5498
17	70.2850	277.0149	-206.7299
18	30.4130	132.4670	-102.0540
19	7.0110	-37.7158	44.7268
20	6.6740	124.4390	-117.7650
21	44.9090	30.6111	14.2979
22	18.5020	75.6138	-57.1118

TABLE 7. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR CONCEPTUAL PHASE (CONT)

MAINTENANCE MAN-HOURS PER FLIGHT HOUR

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	119.31396
AREA 7	-2.38029
WEIGHT 8	0.08311
THKNES 9	49.69275
LAYERS 10	21.05412
PANELS 11	8.99422
HEIGHT 12	-17.67755
MX SPD 18	2.48558
MX ALT 19	-0.16402
CR SPD 20	97.76114
CR ALT 21	-0.47288
STL SP 23	61.34604
LD DST 24	-5.80910
GRS WT 25	0.53202
MAX G 26	-11.72314
KFH/AC 59	-20.35262
KFL/AC 60	5.16529

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	TODIST 22		0.5226	0.2731
2	MAX G 26		0.6133	0.3762
3	KFH/AC 59		0.6607	0.4366
4	THKNES 9		0.6848	0.4689
5	LD DST 24		0.7007	0.4910
6	PANELS 11		0.7234	0.5233
7	CR SPD 20		0.7599	0.5775
8	MX ALT 19		0.7922	0.6275
9	CR ALT 21		0.7987	0.6379
10	HEIGHT 12		0.8119	0.6591
11	GRS WT 25		0.8663	0.7505
12		TODIST 22	0.8663	0.7505
13	AREA 7		0.8772	0.7695
14	LAYERS 10		0.8828	0.7793
15	STL SP 23		0.8851	0.7834
16	KFL/AC 60		0.8921	0.7959
17	MX SPD 18		0.8927	0.7970
18	WEIGHT 8		0.8937	0.7988

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	57.3400	73.6511	-16.3111
2	18.1800	0.1262	18.0538
3	103.0900	118.7179	-15.6279
4	23.1900	31.6106	-8.4206
5	28.9200	51.8707	-22.9507
6	76.9800	83.2431	-6.2631
7	15.2500	20.6283	-5.3783
8	39.6500	65.8517	-26.2017
9	243.9700	203.1082	40.8618
10	83.4700	62.4038	21.0662
11	53.4700	22.1552	31.3148
12	12.6100	32.3025	-19.6925
13	36.6700	15.6437	21.0263
14	53.7300	49.3292	4.4008
15	27.0900	48.3035	-21.2135
16	67.5400	18.5963	48.9437
17	58.5400	73.6662	-15.1262
18	20.6300	24.9747	-4.3447
19	4.9100	-19.9458	24.8558
20	0.5700	27.0704	-26.5004
21	38.3400	36.9175	1.4225
22	11.7100	35.6311	-23.9211

TABLE 7. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR CONCEPTUAL PHASE (CONT)

LOGISTIC SUPPORT COST PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	-20.25534
AREA 7	0.08950
WEIGHT 8	-0.03222
LAYERS 10	-1.37016
HEIGHT 12	1.84484
MX SPD 18	-2.39425
MX ALT 19	0.06226
CR SPD 20	-3.74837
TODIST 22	-0.22456
STL SP 23	24.29369
LD DST 24	-0.12678
GRS WT 25	-0.03260
MAX G 26	-1.09386
KFH/AC 59	1.27659
KFL/AC 60	-0.71525

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	MAX G 26		0.5189	0.2693
2	TODIST 22		0.5351	0.2864
3	AREA 7		0.5797	0.3361
4	STL SP 23		0.5975	0.3570
5	MX SPD 18		0.6128	0.3755
6	MX ALT 19		0.6368	0.4055
7	CR ALT 21		0.6843	0.4683
8	LD DST 24		0.7006	0.4908
9	HEIGHT 12		0.7245	0.5249
10	GRS WT 25		0.7355	0.5409
11	WEIGHT 8		0.7394	0.5467
12	THKNES 9		0.7417	0.5501
13	CR SPD 20		0.7456	0.5559
14	KFH/AC 59		0.7535	0.5677
15		CR ALT 21	0.7535	0.5677
16	KFL/AC 60		0.7592	0.5764
17		THKNES 9	0.7590	0.5762
18	LAYERS 10		0.7635	0.5829

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	2.2602	1.5903	0.6699
2	0.6224	-2.9456	3.5680
3	6.7140	7.5280	-0.8140
4	1.0997	3.7839	-2.6841
5	1.2411	4.3319	-3.0908
6	6.0261	7.1169	-1.0908
7	3.4517	3.7029	-0.2513
8	3.5205	7.4133	-3.8928
9	7.5225	2.3177	5.2048
10	13.8390	11.8803	1.9587
11	1.3383	-2.8267	4.1650
12	0.3356	1.6357	-1.3001
13	1.0078	0.3846	0.6232
14	1.4725	0.7016	0.7710
15	1.1824	0.9320	0.2504
16	26.0920	15.2982	10.7938
17	2.2030	9.3030	-7.1000
18	0.9704	4.5973	-3.6269
19	0.3218	-1.6540	1.9757
20	0.2653	4.6423	-4.3770
21	4.7843	4.3036	0.4807
22	0.7457	2.9814	-2.2357

TABLE 7. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR CONCEPTUAL PHASE (CONCL)

MAINTENANCE MAN-HOURS PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	8.64635)
AREA 7	-0.10323
WEIGHT 8	0.02039
THKNES 9	3.69337
LAYERS 10	2.58390
PANELS 11	-0.06778
HEIGHT 12	-1.38146
MX ALT 19	-0.00719
CR SPD 20	4.93809
CR ALT 21	-0.02004
TODIST 22	-0.05901
STL SP 23	4.02984
LD DST 24	-0.21465
GRS WT 25	0.03168
MAX G 26	-1.31645
KFH/AC 59	-0.70902
KFL/AC 60	0.24318

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	WEIGHT 8		0.7366	0.5426
2	MAX G 26		0.7648	0.5850
3	CR SPD 20		0.7979	0.6366
4	LAYERS 10		0.8165	0.6667
5	LD DST 24		0.8319	0.6920
6	MX SPD 18		0.8434	0.7114
7	KFL/AC 60		0.8605	0.7405
8	TODIST 22		0.8769	0.7690
9	HEIGHT 12		0.8840	0.7814
10	GRS WT 25		0.9056	0.8202
11	CR ALT 21		0.9214	0.8489
12	AREA 7		0.9298	0.8646
13	KFH/AC 59		0.9374	0.8786
14		KFL/AC 60	0.9373	0.8786
15	MX ALT 19		0.9423	0.8880
16	STL SP 23		0.9434	0.8900
17		MX SPD 18	0.9434	0.8900
18	THKNES 9		0.9438	0.8908
19	KFL/AC 60		0.9451	0.8932
20	PANELS 11		0.9455	0.8939

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	2.4041	3.3477	-0.9436
2	0.5948	-0.2155	0.8102
3	6.4680	7.3798	-0.9118
4	1.2079	1.6895	-0.4816
5	1.0581	2.3269	-1.2688
6	6.7145	6.9755	-0.2611
7	3.1556	3.5954	-0.4398
8	2.8518	4.1825	-1.3307
9	11.6030	9.4302	2.1728
10	13.5492	12.4028	1.1464
11	1.7616	0.4430	1.3186
12	0.3562	1.3254	-0.9692
13	1.0731	-0.2727	1.3458
14	1.6026	1.3932	0.2094
15	1.4314	2.8455	-1.4142
16	1.4324	-0.9094	2.3418
17	1.0909	1.7687	-0.6778
18	0.9894	0.6994	0.2900
19	0.3321	-1.0332	1.3653
20	0.0168	1.1954	-1.1786
21	5.6879	5.5042	0.1837
22	0.3578	1.6653	-1.3075

TABLE 8. ESTIMATED CANOPY LSC EQUATIONS FOR ALL VARIABLES

MAINTENANCE MAN-HOURS
PER FLIGHT HOURS

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	7.55992
AREA 7	0.00849
LAYERS 10	-2.26422
HEIGHT 12	11.80965
MX ALT 19	-0.03160
CR ALT 21	-0.09548
STL SP 23	2.64218
LD DST 24	-1.07345
GRS WT 25	-0.20222
MAX G 26	-1.62497

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	CR ALT 21		0.7775	0.6045
2	HEIGHT 12		0.9214	0.8489
3	LD DST 24		0.9661	0.9334
4	GRS WT 25		0.9904	0.9809
5	MX ALT 19		0.9974	0.9948
6	MAX G 26		0.9988	0.9977
7	LAYERS 10		0.9998	0.9996
8	STL SP 23		1.0000	1.0000
9	AREA 7		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	21.6600	21.6689	-0.0089
2	2.9800	2.9762	0.0038
3	0.4700	0.4707	-0.0007
4	9.6300	9.6276	0.0024
5	6.7400	6.7344	0.0056
6	2.2900	2.2895	0.0005
7	18.8700	18.8714	-0.0014
8	16.9900	16.9916	-0.0016
9	1.9200	1.9255	-0.0055
10	1.6400	1.6366	0.0034
11	54.0100	54.0063	0.0036

LOGISTIC SUPPORT COST
PER FLIGHT HOUR

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	93.59042
HEIGHT 12	23.60934
MX ALT 19	0.08179
CR ALT 21	-0.22589
STL SP 23	32.43345
LD DST 24	-2.05314
GRS WT 25	-1.20406
MAX G 26	-3.87151
ELEV 27	0.01150
MAXDSP 32	-1.53935

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	CR ALT 21		0.7630	0.5822
2	HEIGHT 12		0.8500	0.7225
3	GRS WT 25		0.8940	0.7992
4	LD DST 24		0.9553	0.9127
5	MAX G 26		0.9810	0.9624
6	MAXDSP 32		0.9916	0.9833
7	STL SP 23		0.9955	0.9910
8	MX ALT 19		0.9996	0.9993
9	ELEV 27		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	35.1350	35.6433	-0.5083
2	3.0980	3.0074	0.0906
3	0.6090	0.5931	0.0159
4	10.2900	10.1813	0.1087
5	10.3460	10.3163	0.0297
6	3.7490	3.7388	0.0102
7	26.2350	26.0797	0.2553
8	11.6740	11.7775	-0.1035
9	5.5510	5.5675	-0.0165
10	22.9940	22.9784	0.0156
11	99.6680	99.5617	0.1063

TABLE 8. ESTIMATED CANOPY LSC EQUATIONS FOR ALL VARIABLES (CONCL)

MAINTENANCE MAN-HOURS PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	-8.40157
HEIGHT 12	0.27039
MX SPD 16	-0.06023
CR SPD 20	0.03405
TODIST 22	-0.05172
STL SP 23	-0.53490
ELEV 27	-0.02700
MXWDSP 32	0.24657
MPRCPT 36	-0.10940
AFL/AC 58	-0.03911

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	MXWDSP 32		0.4798	0.2302
2	ELEV 27		0.7976	0.6361
3	TODIST 22		0.9330	0.8706
4	MPRCPT 36		0.9846	0.9694
5	AFL/AC 58		0.9943	0.9886
6	STL SP 23		0.9970	0.9940
7	HEIGHT 12		0.9985	0.9970
8	MX SPD 18		1.0000	0.9999
9	CR SPD 20		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	0.9082	0.9101	-0.0019
2	0.0978	0.0980	-0.0003
3	0.0237	0.0224	0.0013
4	0.3516	0.3510	0.0006
5	0.2220	0.2230	-0.0010
6	6.4805	6.4803	0.0002
7	0.5524	0.5519	0.0005
8	0.5070	0.5075	-0.0005
9	0.1296	0.1301	-0.0005
10	0.0487	0.0477	0.0010
11	1.6506	1.6502	0.0004

LOGISTIC SUPPORT COST PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	-11.66748
PANELS 11	-0.65442
CR ALT 21	-0.01303
STL SP 23	-0.59316
EXMX T 28	0.02872
EXMN T 29	-0.05924
M MX T 30	-0.12673
HMDT04 34	-0.05391
MPRCPT 36	-0.01834
AFH/AC 57	-0.60208

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	CR ALT 21		0.7726	0.5969
2	AFH/AC 57		0.8207	0.6867
3	MPRCPT 36		0.8799	0.7743
4	EXMN T 29		0.9125	0.8326
5	EXMX T 28		0.9463	0.8955
6	PANELS 11		0.9698	0.9406
7	M MX T 30		0.9951	0.9909
8	HMDT04 34		0.9982	0.9964
9	STL SP 23		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	0.9835	0.9839	-0.0004
2	0.0730	0.0729	0.0001
3	0.0205	0.0218	-0.0013
4	0.2898	0.2887	0.0011
5	0.1936	0.1948	-0.0012
6	0.0891	0.0886	0.0004
7	0.5236	0.5240	-0.0004
8	0.3970	0.3970	0.0001
9	0.2547	0.2539	0.0008
10	0.9142	0.9131	0.0011
11	4.0167	4.0169	-0.0001

TABLE 9. ESTIMATED WINDSHIELD LSC EQUATIONS FOR ALL VARIABLES

LOGISTIC SUPPORT COST PER FLIGHT HOUR

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	CR ALT 21		0.3596	0.1293
2	EXMN T 29		0.4187	0.1753
3	M WDSP 33		0.4630	0.2144
4	M MN T 31		0.5211	0.2715
5	HMDT04 34		0.5755	0.3312
6	MAX G 26		0.6409	0.4107
7	MX ALT 19		0.6686	0.4470
8	TODIST 22		0.7007	0.4910
9	KFL/AC 60		0.7177	0.5151
10	MXWDSP 32		0.7425	0.5513
11	CR SPD 20		0.7812	0.6103
12	PANELS 11		0.8021	0.6433
13	NO.A/C 17		0.8178	0.6688
14		EXMN T 29	0.8178	0.5688
15	HMDT13 35		0.8396	0.7050
16		M WDSP 33	0.8396	0.7049
17	ELEV 27		0.8551	0.7312
18	LAYERS 10		0.8618	0.7426
19	MPRCPT 36		0.8685	0.7543
20		M MN T 31	0.8685	0.7543
21		PANELS 11	0.8685	0.7543
22	EXMX T 28		0.8802	0.7748
23		MX ALT 19	0.8802	0.7747
24	LD DST 24		0.9132	0.8339
25	GRS WT 25		0.9219	0.8498
26	HEIGHT 12		0.9367	0.8775
27	EXMN T 29		0.9483	0.8993
28	M MX T 30		0.9717	0.9441
29		EXMX T 28	0.9716	0.9441
30	AREA 7		0.9980	0.9961
31	PANELS 11		1.0000	1.0000
32	WEIGHT 8		1.0000	1.0000

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	-1415.44629
AREA 7	9.19696
WEIGHT 8	0.08176
LAYERS 10	353.62793
PANELS 11	-30.61572
HEIGHT 12	-45.84154
NO.A/C 17	-0.99632
CR SPD 20	568.01904
CR ALT 21	-1.55576
TODIST 22	-22.38133
LD DST 24	-39.95024
GRS WT 25	2.70378
MAX G 26	-153.51801
ELEV 27	6.07518
EXMN T 29	-17.61847
M MX T 30	37.64369
MXWDSP 32	-17.89919
HMDT04 34	-1.92497
HMDT13 35	-18.00066
MPRCPT 36	38.99474
KFL/AC 60	-74.09616

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	80.7490	80.7695	-0.0205
2	26.4220	26.4951	-0.0731
3	47.9420	47.8633	0.0787
4	32.6380	32.6741	-0.0361
5	44.0650	44.1580	-0.0930
6	57.4640	57.4497	0.0143
7	5.8050	5.7556	0.0494
8	20.2280	20.2183	0.0097
9	88.7840	88.8420	-0.0580
10	73.2360	73.3713	-0.1353
11	71.5060	71.4634	0.0426
12	14.1280	14.1089	0.0191
13	51.8450	51.8452	-0.0002
14	43.2960	43.1443	0.1517
15	32.3830	32.3315	0.0515
16	733.5029	733.4951	0.0078
17	48.1180	48.1426	-0.0246
18	26.6690	26.5791	0.0899
19	7.0110	7.0635	-0.0525
20	6.6740	6.7568	-0.0828
21	26.7520	26.6506	0.1014
22	18.5020	18.5630	-0.0610

TABLE 9. ESTIMATED WINDSHIELD LSC EQUATIONS FOR ALL VARIABLES (CONT)

MAINTENANCE MAN-HOURS PER FLIGHT HOUR

EQUATION

VARIABLE	COEFFICIENT
CONSTANT	730.78882
WEIGHT 8	-0.19961
THKNES 9	40.57416
LAYERS 10	29.22575
PANELS 11	8.24424
HEIGHT 12	8.79937
MX SPD 18	9.02250
CR ALT 21	0.17042
TODIST 22	1.30524
STL SP 23	-108.30472
LD DST 24	-3.60049
GRS WT 25	-0.30933
ELEV 27	0.05871
EXMX T 28	-20.43533
EXMN T 29	3.57300
M MX T 30	44.20876
M MN T 31	-45.08635
MXWDSP 32	5.52667
M WDSP 33	-36.11420
HMDT04 34	5.51110
AFL/AC 58	-5.41803

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	AFL/AC 58		0.3819	0.1458
2	EXMN T 29		0.5208	0.2712
3	M MN T 31		0.6253	0.3909
4	MAX G 26		0.6620	0.4382
5	NO.A/C 17		0.6976	0.4866
6	GRS WT 25		0.7183	0.5159
7	TODIST 22		0.7330	0.5373
8	STL SP 23		0.7978	0.6365
9	MXWDSP 32		0.8343	0.6960
10	M MX T 30		0.8516	0.7252
11	HMDT04 34		0.8670	0.7517
12	WEIGHT 8		0.8748	0.7652
13	HEIGHT 12		0.8829	0.7795
14	EXMX T 28		0.8932	0.7977
15		MAX G 26	0.8931	0.7976
16	THKNES 9		0.9282	0.8615
17		NO.A/C 17	0.9282	0.8615
18	MX SPD 18		0.9421	0.8875
19	LAYERS 10		0.9555	0.9130
20	LD DST 24		0.9674	0.9359
21	M WDSP 33		0.9777	0.9559
22	CR ALT 21		0.9911	0.9823
23	ELEV 27		0.9976	0.9952
24	PANELS 11		0.9995	0.9990

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	57.3400	56.0728	1.2672
2	18.1800	18.2949	-0.1149
3	24.5700	24.9814	-0.4114
4	23.1900	23.4255	-0.2355
5	28.9200	28.6177	0.3023
6	51.5700	51.2493	0.3207
7	3.4600	3.2192	0.2408
8	12.7900	14.2358	-1.4458
9	100.8200	100.9358	-0.1158
10	51.4600	50.9507	0.5093
11	53.4700	53.6379	-0.1679
12	12.6100	12.4060	0.2040
13	36.6700	37.7092	-1.0392
14	53.7300	53.9490	-0.2190
15	27.0900	29.1921	-2.1021
16	62.8700	62.8430	0.0270
17	38.5400	37.4875	1.0524
18	18.2500	18.4277	-0.1777
19	4.9100	3.7512	1.1588
20	0.5700	0.0952	0.4748
21	24.8600	24.9382	-0.0782
22	11.7100	11.1384	0.5716

TABLE 9. ESTIMATED WINDSHIELD LSC EQUATIONS FOR ALL VARIABLES (CONT)

LOGISTIC SUPPORT COST PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	-355.05688
THKNES 9	-7.84145
LAYERS 10	10.70743
PANELS 11	5.56683
MX SPD 18	0.32104
MX ALT 19	0.06110
CR SPD 20	8.61024
CR ALT 21	-0.03915
TODIST 22	-0.31356
STL SP 23	28.56554
LD DST 24	-1.71404
GRS WT 25	0.04613
MAX G 26	-2.87563
ELEV 27	0.10567
EXMX T 28	1.18623
EXMN T 29	-0.80591
M MX T 30	2.13265
MXWDSP 32	-0.05540
HMDT04 34	0.12595
HMDT13 35	-0.28187
MPRCPT 36	1.19477

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	MULTIPLE RSQ
1	MAX G 26		0.3641	0.1326
2	HMDT04 34		0.4593	0.2110
3	CR ALT 21		0.5407	0.2924
4	MXWDSP 32		0.6209	0.3855
5	HMDT13 35		0.6491	0.4214
6	EXMN T 29		0.6894	0.4753
7	TODIST 22		0.7131	0.5085
8	CR SPD 20		0.7553	0.5705
9	PANELS 11		0.7829	0.6129
10	EXMX T 28		0.8130	0.6609
11	THKNES 9		0.8456	0.7150
12		EXMN T 29	0.8456	0.7150
13	LD DST 24		0.8584	0.7369
14	MPRCPT 36		0.8709	0.7584
15	ELEV 27		0.8936	0.7984
16	MX SPD 18		0.9256	0.8568
17	LAYERS 10		0.9310	0.8667
18		HMDT04 34	0.9309	0.8667
19	M MX T 30		0.9366	0.8772
20	EXMN T 29		0.9535	0.9091
21	GRS WT 25		0.9639	0.9291
22	STL SP 23		0.9791	0.9586
23	MX ALT 19		0.9998	0.9996
24	HMDT04 34		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	2.2602	2.2803	-0.0201
2	0.6224	0.6218	0.0006
3	2.0165	2.0059	0.0106
4	1.0997	1.1084	-0.0087
5	1.2411	1.2520	-0.0108
6	3.7909	3.8108	-0.0199
7	0.7817	0.7849	-0.0032
8	1.0665	1.0930	-0.0266
9	3.0021	2.9614	0.0407
10	8.5723	8.5654	0.0069
11	1.3383	1.2856	0.0527
12	0.3356	0.3511	-0.0154
13	1.0078	1.0300	-0.0222
14	1.4725	1.4714	0.0011
15	1.1824	1.1628	0.0195
16	25.8619	25.8657	-0.0038
17	1.5082	1.5029	0.0053
18	0.8510	0.8589	-0.0079
19	0.3218	0.3335	-0.0117
20	0.2653	0.2676	-0.0022
21	2.8500	2.8516	-0.0016
22	0.7457	0.7402	0.0054

TABLE 9. ESTIMATED WINDSHIELD LSC EQUATIONS FOR ALL VARIABLES (CONCL)

MAINTENANCE MAN-HOURS PER AIRCRAFT

EQUATION

VARIABLE	COEFFICIENT
(CONSTANT	-15.27891
AREA 7	-0.15206
WEIGHT 8	0.02318
LAYERS 10	0.80615
PANELS 11	-0.22094
HEIGHT 12	-1.14009
CR SPD 20	4.06894
CR ALT 21	-0.03243
TODIST 22	0.01442
LD DST 24	-0.17790
GRS WT 25	0.02374
MAX G 26	-0.51284
ELEV 27	0.01462
EXMX T 28	0.28913
EXMN T 29	0.01085
M MN T 31	-0.10317
MXWDSP 32	-0.19383
M WDSP 33	2.72449
HMDT04 34	-0.18487
MPRCPT 36	0.27048
AFL/AC 58	-0.16581

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	WEIGHT 8		0.7237	0.5238
2	M WDSP 33		0.7542	0.5689
3	HEIGHT 12		0.7825	0.6123
4	MAX G 26		0.8139	0.6625
5	CR SPD 20		0.8469	0.7173
6	AFL/AC 58		0.8719	0.7603
7	CR ALT 21		0.8919	0.7955
8	EXMX T 28		0.9302	0.8652
9	LD DST 24		0.9479	0.8985
10	LAYERS 10		0.9626	0.9266
11	MPRCPT 36		0.9660	0.9332
12	ELEV 27		0.9702	0.9412
13	GRS WT 25		0.9768	0.9542
14	MXWDSP 32		0.9797	0.9598
15	AREA 7		0.9889	0.9778
16	HMDT04 34		0.9950	0.9900
17	M MN T 31		0.9984	0.9967
18	TODIST 22		0.9995	0.9991
19	PANELS 11		0.9999	0.9998
20	EXMN T 29		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	2.4041	2.4062	-0.0021
2	0.5948	0.5950	-0.0002
3	1.5415	1.5365	0.0050
4	1.2079	1.2103	-0.0024
5	1.0581	1.0645	-0.0064
6	4.4971	4.4974	-0.0003
7	0.7167	0.7133	0.0034
8	0.9202	0.9265	-0.0063
9	4.7948	4.7964	-0.0016
10	8.3537	8.3574	-0.0037
11	1.7616	1.7642	-0.0026
12	0.3562	0.3560	0.0003
13	1.0731	1.0642	0.0089
14	1.6026	1.5942	0.0084
15	1.4314	1.4269	0.0045
16	1.3338	1.3266	0.0071
17	0.7182	0.7240	-0.0058
18	0.8753	0.8698	0.0056
19	0.3321	0.3406	-0.0085
20	0.0168	0.0206	-0.0038
21	3.6862	3.6808	0.0054
22	0.3578	0.3624	-0.0045

TABLE 10. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR ALL VARIABLES

LOGISTIC SUPPORT COST PER FLIGHT HOUR

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		581.28882)
AREA	7	-4.83170
WEIGHT	8	-3.81249
THKNES	9	354.26855
LAYERS	10	445.95801
HEIGHT	12	-4.27065
NO.A/C	17	-1.88248
MX SPD	18	30.87859
TODIST	22	-3.45557
LD DST	24	1.06090
GRS WT	25	0.94164
MAX G	26	-187.27136
ELEV	27	2.32696
EXMX T	28	-15.57683
EXMN T	29	9.73983
M MX T	30	49.07944
MXWDSP	32	-47.77766
M WDSP	33	71.18530
HMDT04	34	10.76729
MPRCPT	36	-8.65720
KFL/AC	60	-11.19359

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	MAX G 26		0.3730	0.1391
2	HMDT04 34		0.4741	0.2248
3	M WDSP 33		0.5649	0.3191
4	EXMN T 29		0.5980	0.3576
5	HMDT13 35		0.6572	0.4319
6	MXWDSP 32		0.6947	0.4826
7	WEIGHT 8		0.7453	0.5555
8		M WDSP 33	0.7452	0.5554
9	HEIGHT 12		0.7913	0.6261
10	LAYERS 10		0.8187	0.6702
11	EXMX T 28		0.8578	0.7359
12	ELEV 27		0.8957	0.8023
13	THKNES 9		0.9153	0.8377
14	KFL/AC 60		0.9250	0.8556
15	TODIST 22		0.9353	0.8748
16	AREA 7		0.9472	0.8973
17		HMDT13 35	0.9472	0.8973
18	M MX T 30		0.9540	0.9100
19	M WDSP 33		0.9670	0.9350
20	NO.A/C 17		0.9737	0.9481
21	MPRCPT 36		0.9813	0.9630
22	MX SPD 18		0.9942	0.9884
23		EXMX T 28	0.9942	0.9884
24	GRS WT 25		0.9969	0.9939
25	EXMX T 28		0.9999	0.9998
26	LD DST 24		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(2)	Y COMPUTED	RESIDUAL
1	80.7490	80.4500	0.2990
2	26.4220	26.3733	0.0487
3	159.6260	159.8596	-0.2336
4	32.6380	33.7717	-1.1337
5	44.0650	43.1958	0.8692
6	91.3460	91.3369	0.0091
7	25.6340	25.0195	0.6145
8	66.7760	67.8350	-1.0590
9	222.4700	222.7480	-0.2780
10	118.2310	117.3689	0.8621
11	71.5060	71.0203	0.4857
12	14.1280	14.9854	-0.8574
13	51.8450	50.8203	1.0247
14	43.2960	43.9666	-0.6705
15	32.3830	32.4551	-0.0721
16	740.0271	740.0293	-0.0022
17	70.2850	70.5393	-0.2543
18	30.4130	29.0583	1.3546
19	7.0110	6.2737	0.7373
20	6.6740	7.6384	-0.9644
21	44.9090	45.4146	-0.5056
22	18.5020	18.7390	-0.2370

TABLE 10. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR ALL VARIABLES (CONT)

MAINTENANCE MAN-HOURS PER FLIGHT HOUR

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		-627.65869)
AREA	7	0.86122
WEIGHT	8	-1.55368
THKNES	9	381.36060
LAYERS	10	58.07622
PANELS	11	8.72747
HEIGHT	12	9.62013
NO.A/C	17	0.95386
MX SPD	18	-5.97269
CR SPD	20	-144.33617
CR ALT	21	0.58950
TODIST	22	3.38423
STL SP	23	482.74146
LD DST	24	-9.42040
GRS WT	25	0.21258
MAX G	26	5.14818
EXMX T	28	-8.29754
EXMN T	29	-0.91098
M MX T	30	20.98965
M MN T	31	-8.96718
AFL/AC	58	6.53885

STEP NUMBER	VARIABLE ENTERED	REMOVED	MULTIPLE R	RSQ
1	TODIST 22		0.5226	0.2731
2	MAX G 26		0.6133	0.3762
3	AFL/AC 58		0.6730	0.4529
4	NO.A/C 17		0.7274	0.5292
5	EXMN T 29		0.7527	0.5665
6	LD DST 24		0.7818	0.6112
7	AREA 7		0.8221	0.6758
8	LAYERS 10		0.8401	0.7058
9	HEIGHT 12		0.8512	0.7246
10	GRS WT 25		0.8834	0.7803
11	WEIGHT 8		0.8981	0.8066
12	PANELS 11		0.9163	0.8397
13	STL SP 23		0.9384	0.8807
14	THKNES 9		0.9492	0.9009
15	M MX T 30		0.9685	0.9380
16	CR SPD 20		0.9839	0.9680
17	CR ALT 21		0.9912	0.9825
18	MX SPD 18		0.9977	0.9954
19	EXMX T 28		0.9986	0.9972
20	M MN T 31		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(4)	Y COMPUTED	RESIDUAL
1	57.3400	57.3025	0.0375
2	18.1800	17.6250	0.5550
3	103.0900	102.9380	0.1520
4	23.1900	23.4475	-0.2575
5	28.9200	28.8943	0.0257
6	76.9800	76.9731	0.0069
7	15.2500	15.0103	0.2397
8	39.6500	39.8757	-0.2257
9	243.9700	244.0186	-0.0486
10	83.4700	83.6091	-0.1391
11	53.4700	53.2236	0.2434
12	12.6100	12.6182	-0.0082
13	36.6700	37.0898	-0.4198
14	53.7300	53.6899	0.0401
15	27.0900	26.9780	0.1120
16	67.5400	66.8826	0.6574
17	58.5400	59.2837	-0.7437
18	20.6300	20.8796	-0.2496
19	4.9100	5.3813	-0.4713
20	0.5700	0.5337	0.0363
21	38.3400	38.1606	0.1794
22	11.7100	11.4553	0.2547

TABLE 10. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR ALL VARIABLES (CONT)

LOGISTIC SUPPORT COST PER AIRCRAFT

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		-1312.64233)
AREA	7	-0.51677
WEIGHT	8	0.04264
THKNES	9	-123.30179
LAYERS	10	71.35947
PANELS	11	-8.50759
MX SPD	18	-1.89434
MX ALT	19	0.43519
CR SPD	20	-7.16910
STL SP	23	-23.41641
MAX Q	26	-22.90062
ELEV	27	0.17971
EXMX T	28	7.84528
EXMN T	29	0.29525
M MX T	30	-9.58868
M MN T	31	17.87071
MXWDSP	32	-0.62024
HMDT04	34	6.76945
HMDT13	35	-4.32588
MPRCPT	36	-0.37289
KFH/AC	59	-0.72780

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	MULTIPLE R	RSQ
1	MAX Q 26		0.5189	0.2693
2	EXMN T 29		0.5918	0.3502
3	MXWDSP 32		0.6242	0.3897
4	HMDT04 34		0.6772	0.4586
5	HMDT13 35		0.7219	0.5211
6	WEIGHT 8		0.7477	0.5590
7	THKNES 9		0.7800	0.6085
8	MPRCPT 36		0.8114	0.6583
9	LAYERS 10		0.8669	0.7515
10	EXMX T 28		0.8889	0.7901
11	ELEV 27		0.9113	0.8304
12	MX SPD 18		0.9261	0.8576
13	M MX T 30		0.9401	0.8839
14	PANELS 11		0.9556	0.9132
15	CR SPD 20		0.9610	0.9234
16	AREA 7		0.9683	0.9377
17	M MN T 31		0.9728	0.9464
18	MX ALT 19		0.9854	0.9710
19	STL SP 23		0.9950	0.9900
20	KFH/AC 59		0.9996	0.9992

LIST OF RESIDUALS

CASE NUMBER	Y X(40)	Y COMPUTED	RESIDUAL
1	2.2602	2.3274	-0.0672
2	0.6224	0.6865	-0.0641
3	6.7140	6.6394	0.0746
4	1.0997	1.1472	-0.0475
5	1.2411	1.2351	0.0060
6	6.0261	5.9534	0.0727
7	3.4517	3.4526	-0.0010
8	3.5205	3.5559	-0.0354
9	7.5225	7.5996	-0.0771
10	13.8390	13.9109	-0.0719
11	1.3383	1.2986	0.0397
12	0.3356	0.3145	0.0212
13	1.0078	1.0203	-0.0124
14	1.4725	1.5278	-0.0553
15	1.1824	1.1572	0.0251
16	26.0920	26.0393	0.0527
17	2.2030	2.2073	-0.0043
18	0.9704	0.9653	0.0051
19	0.3218	0.4102	-0.0884
20	0.2653	0.1458	0.1196
21	4.7843	4.7405	0.0438
22	0.7457	0.6792	0.0665

TABLE 10. ESTIMATED WINDSHIELD AND OTHER COCKPIT WINDOWS LSC EQUATIONS FOR ALL VARIABLES (CONCL)

MAINTENANCE MAN-HOURS PER AIRCRAFT

EQUATION

VARIABLE		COEFFICIENT
(CONSTANT		192.82576
AREA	7	0.06776
WEIGHT	8	-0.04251
THKNES	9	34.16536
LAYERS	10	4.13132
HEIGHT	12	-0.93369
MX ALT	19	-0.02534
CR SPD	20	-2.29547
CR ALT	21	0.02681
STL SP	23	17.38011
LD DST	24	-0.44890
GRS WT	25	0.02676
MAX G	26	-0.34952
EXMX T	28	-2.83628
M MX T	30	4.28887
M MN T	31	-3.97900
MXWDSP	32	0.01380
HMDT04	34	-0.12035
MPRCPT	36	0.09226
AFH/AC	57	-0.88729
AFL/AC	58	0.40716

STEP NUMBER	VARIABLE ENTERED	REMOVED	MULTIPLE R	RSQ
1	WEIGHT 8		0.7366	0.5426
2	MAX G 26		0.7648	0.5850
3	CR SPD 20		0.7979	0.6366
4	LAYERS 10		0.8165	0.6667
5	EXMX T 28		0.8501	0.7228
6	HEIGHT 12		0.8771	0.7693
7	LD DST 24		0.8939	0.7991
8	GRS WT 25		0.9075	0.8235
9	CR ALT 21		0.9319	0.8684
10	M MN T 31		0.9424	0.8882
11	AREA 7		0.9472	0.8972
12	STL SP 23		0.9576	0.9171
13	THKNES 9		0.9595	0.9207
14	M MX T 30		0.9839	0.9680
15	MX ALT 19		0.9862	0.9726
16	AFH/AC 57		0.9890	0.9781
17	AFL/AC 58		0.9968	0.9935
18	MPRCPT 36		0.9985	0.9969
19	HMDT04 34		1.0000	1.0000
20	MXWDSP 32		1.0000	1.0000

LIST OF RESIDUALS

CASE NUMBER	Y X(48)	Y COMPUTED	RESIDUAL
1	2.4041	2.3882	0.0159
2	0.5948	0.5967	-0.0019
3	6.4680	6.4723	-0.0042
4	1.2079	1.2038	0.0041
5	1.0581	1.0679	-0.0098
6	6.7145	6.7122	0.0023
7	3.1556	3.1490	0.0065
8	2.8518	2.8483	0.0035
9	11.6030	11.5840	0.0190
10	13.5492	13.5698	-0.0207
11	1.7616	1.7904	-0.0288
12	0.3562	0.3507	0.0056
13	1.0731	1.0539	0.0192
14	1.6026	1.5899	0.0127
15	1.4314	1.4392	-0.0079
16	1.4324	1.4339	-0.0015
17	1.0909	1.1031	-0.0121
18	0.9894	0.9735	0.0160
19	0.3321	0.3174	0.0147
20	0.0168	0.0452	-0.0284
21	5.6879	5.6884	-0.0004
22	0.3578	0.3680	-0.0101

SECTION IV

CORRECTIVE PROGRAMS

DESIGN IMPROVEMENTS

As a result of the effort of the tasks defined in Volumes I and II, five design improvments were selected as candidates for reducing logistical cost. Initial examination of failure and cost data indicated that a large number of transparency systems for the 20 study aircraft were likely candidates. In view of the effort required to research, analyze, and assemble these data, the scope of the program permitted the development of only five design improvement studies. During the field audit phase of this program it was ascertained that several aircraft such as the F-15 and F-111 were involved in ongoing transparency modification programs. These aircraft were consequently eliminated as candidates for the study. The corrective programs reviewed resulted in the following design improvement trade studies.

Design Improvement Trade 1, T-39A Windsheild Anti-icing Controller Redesign

Design Improvement Trade 3, KC-135A Boom Sighting Door and Window Redesign

Design Improvement Trade 4, B-52G/H Windshield and Window Redesign

Design Improvement Trade 5, C-141A Windshield Redesign

Design Improvement Trade 6, T-38A Canopy Locking Mechanism Redesign

The ground rules imposed in the selection of these candidate improvements were to review the study aircraft to identify those aircraft having high annual expenditure in maintenance of transparency systems. The procedures used to determine the cost effectiveness of the proposed revisions are described in section II, Volume III, of this report.

Other factors considered in the selection of these candidate improvements were to ensure that the proposed improvements would result in the minimum

modification to the existing configuration. With the complexity of the equipment contained in the interior of the modern aircraft, a very important factor was to avoid the domino effect of causing other related changes. This effect could possibly negate the cost reduction exercised in the selection of design improvements.

Another important consideration in keeping the extent of change to a minimum was to prevent extensive and costly requalification testing. By limiting the amount of modification, requalification by analysis is considered to be acceptable. Analysis on this basis of similarity can greatly reduce the amount of retesting that may be required.

Care was given to avoid change to external configuration that might result in reduced performance. In addition, the selection of the candidate improvements also considered the relative importance the aircraft has in the total posture of the Air Force inventory.

The final consideration in limiting the extent of the proposed changes was to make a field modification feasible and cost effective. It is believed that the proposed corrective programs contained in this section are cost effective and will result in reduced maintenance and other logistical support cost.

FAILURE ANALYSIS

A failure analysis was made for each of the 20 selected transparency systems. The process utilized was through the extraction of maintenance data from the AFM 66-1 data tapes, using the Maintenance Analysis Model (MAM's) program as described in Section II, Volume III, of this report. The failure mode descriptors in combination with the flight hours, logistical cost is shown in a sample printout as listed in figure 5.

From the MAM's tabulation an assessment as to how the component or part failed was condensed in the form of a failure fault tree, and failure analysis summarizing the more significant How Mal, action taken, and probable cause.

Since each MAM's printout may contain from 20 to 200 pages for each transparency system, it was deemed advisable to include the failure analysis for only the selected candidate improvement studies in this report. These failure analyses are found in the following trade studies section and in Appendix A to this volume.

The master transparency system list as contained in Appendix A of Volume II includes the first five ranks by LSC, the major How-Mal codes, and the corresponding percent of maintenance man-hours.

In the cases where the level of description was inadequate the failure assessment was supplemented with the information collected during the field audit or by a followup call to the contacts made during the field audits.

COST ANALYSIS

The cost analyses performed in support of the trade studies shown in this section are based on a 10-year life cycle cost projection. The basis for establishing the annual costs (see table 1, Volume I) was the current AFM 66-1 data tapes whose timespan started in January 1976 and concluded in June 1977, a period of 18 months. In order to establish a uniform basis for evaluation, the aircraft dollars-per-month cost of the K051 current and previous three quarters were combined, while the 18-month, AFM 66-1, flight hours and/or maintenance hours data were ratioed to provide an annual rate.

Having established a consistent annual reference baseline, it was then necessary to escalate these costs to the current year 1978 and to 1988 for the 10-year life cycle cost for effecting the desired trades. The escalation factors used for this purpose were obtained from the USAF "Cost and Planning Factors," ART 173-110, Volume I, 6 February 1975, amended May 1977. The escalation factors for these timespans are:

Escalation Factors

Mid-1976 to 1978 is 1.1587
1978 to 1985[1] is 1.2250

During the processing of the K051 logistical cost data it became apparent that various entries in some of the data, as extracted from microfiche, were either omitted or included in the average monthly cost totals for each quarterly entry. The sample K051 logistical support, figures 6 and 7 of Volume I, indicates this possibility. Attempts to reconcile these discrepancies through contact with the data collection agency and/or by correlation of field audit data met with limited success. It was concluded that, in many cases, the distribution of field maintenance, special repair, packaging, and condemnation costs were not reported but included in the total average monthly costs. Although some of these values are suspect, they were left unchanged to maintain consistency for basis of comparison of the total logistical support cost reported for each aircraft.

In the evaluation and assembly of the trade studies presented in this volume, adjustments were made to some of the annual LSC totals. This was done to ensure the validity of the trade study, where known special repair activity or a more accurate accounting of maintenance actions were identified. The variations and changes are shown in the detailed cost analysis contained in this section. Other factors unique to the trade study are also included in the detail cost analysis.

TRADE STUDIES

The result of the trade studies presented in this section were based on analysis considering a 10-year life cycle cost. The studies conducted indicate that appreciable savings in maintenance and logistical costs for the proposed design changes are possible. The principal factors traded are the projected cost of maintaining the present concept against the redevelopment, replacement,

(1) Midpoint average for 10-year LSC.

and maintenance costs for the redesigned concept. The evaluation of these trades follows.

DESIGN IMPROVEMENT TRADE STUDY 1, T-39A WINDSHIELD ANTI-ICING CONTROLLER REDESIGN

Problem

A study of the K051 IROS and AFM 66-1 maintainability data as contained in the MAM's Program and included in Appendix A indicates that the SCV-896 (figure 8) windshield controller is the number one cost contributor in the T-39A transparency system. Due to the complexity of the controller, the unit often fails to operate properly. This unit is a germanium, semiconductor-type controller providing a time delay device to prevent thermal shock of the windshield during cold ambient startup of the anti-icing system. The principal causes for these failures are depicted in T-39 transparency system fault tree (figure 9). Many of these units are frequently removed and replaced, and many are sent to a contract depot for repair. It has also been determined that a substantial number of man-hours are expended in cannibalizing other aircraft as a source of usable controllers.

A study of the field service bulletins for the early model commercial Sabreliners using the SCV-896 controller indicates that approximately 12 percent of the failures associated with cracking and delaminations of the windshield can be attributed to the failed controller. A summary of the combined failure modes of both the controller and windshield panel is shown in figure 10.

Proposed Revision

To substantially reduce this high-cost maintenance problem, it is recommended that a new heat controller, CSV-2708, be substituted for the SCV-896-41 model. The model CSV-2708, using current solid-state technology, has been

developed for use in the Sabreliner aircraft. The proposed replacement controller, model C: V-2708-11, is directly interchangeable with the current modified model SCV-896-41. The interchange of this controller will also result in a significant reduction in windshield replacement caused by controller failures.

Cost Analysis

The cost analysis for the proposed change is summarized in table 11. It presents the 10-year life cycle cost projection for the present concept as compared to the cost of redesign, requalification and retrofit, and reduced maintenance. Table 12 is the detailed cost analysis statement of the step-by-step assembly of logic, and costing factor used to develop the cost trade.

An annual saving of $92,200 for the controller substitution, with an accompanying annual fallout saving of $21,900 for windshield panels, can be realized as a result of this proposed change.

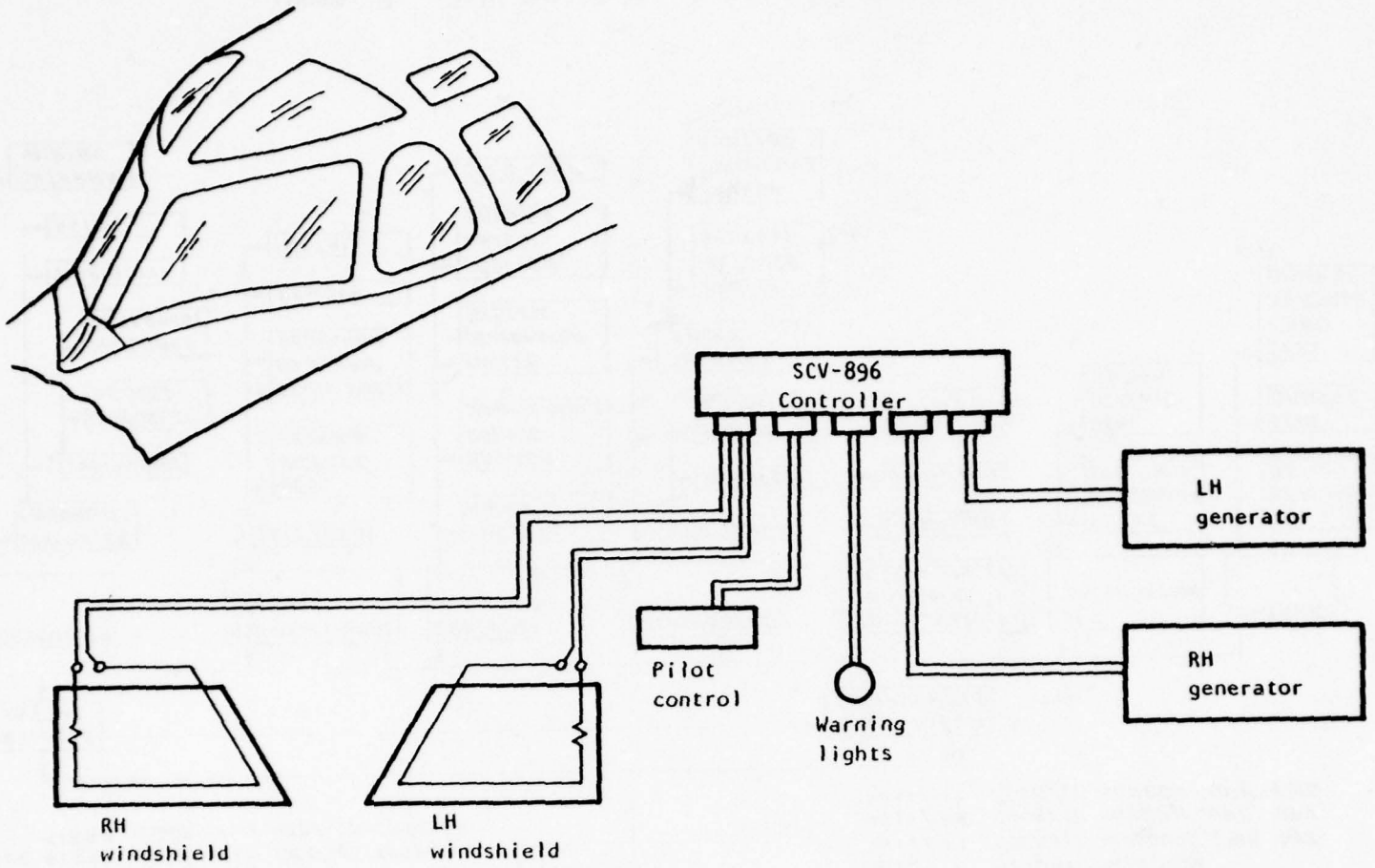


Figure 8. T-39A Windshield Arrangement and Anti-icing System Diagram

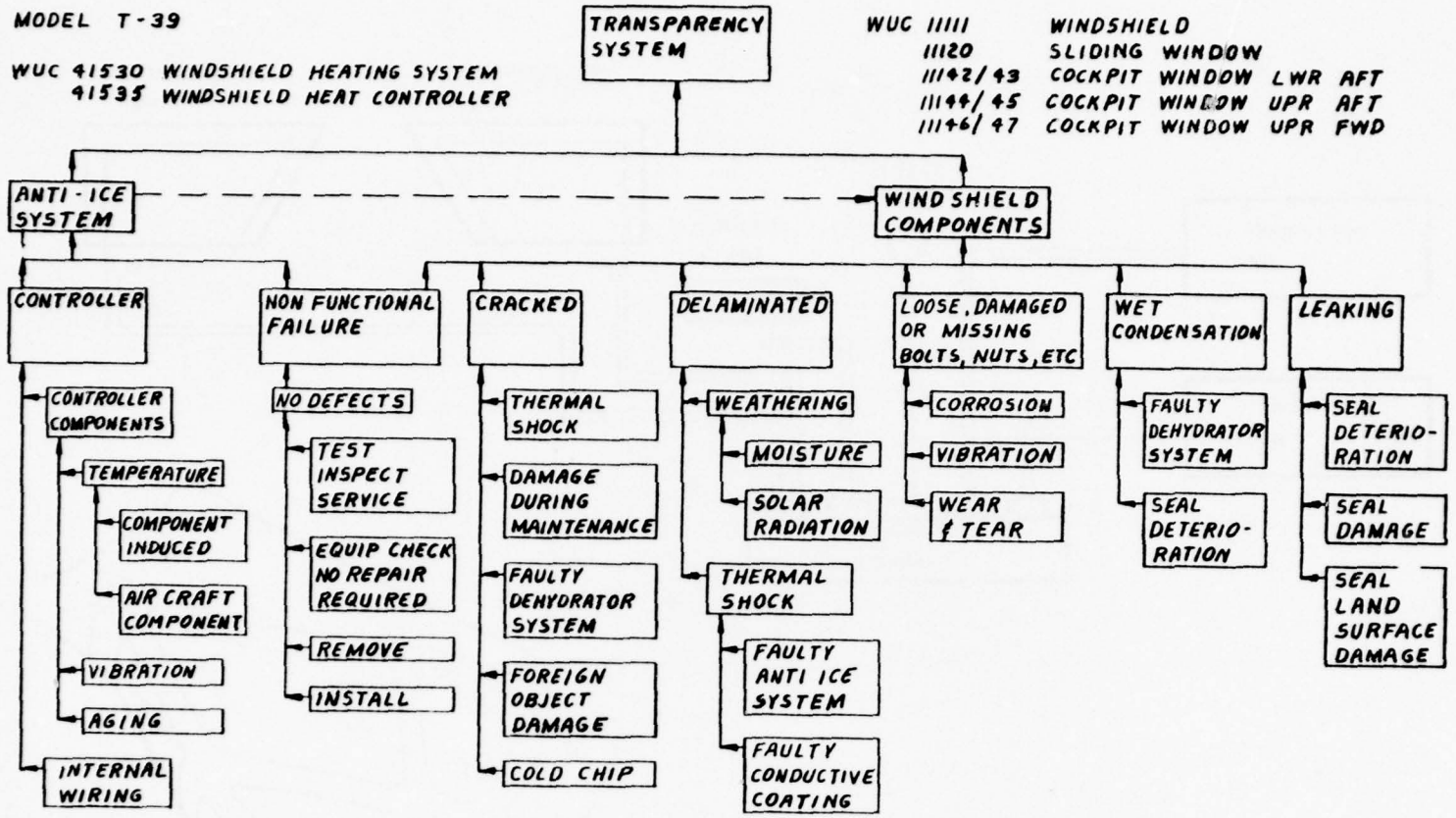


Figure 9 Fault Tree T-39 Cockpit Transparency System

HOW MAL	ACTION TAKEN	PROBABLE CAUSE
WUC 41535 CONTROLLER		
799 - NO DEFECT	T - REMOVED FOR CANNIBALIZATION X - TEST, INSPECT, SERVICE H - EQUIPMENT CHECK	•PART SHORTAGE •INTERRELATED WITH OTHER HOW MAL CODES
374 - INTERNAL FAILURE 242 - FAILED TO OPERATE 169 - INCORRECT VOLTAGE 615 - SHORTED	R - REMOVE AND REPLACE 1 - BENCH CHECKED - NOT REPARABLE THIS STATION	•COMPONENT FAILURE •VIBRATION •SHOCK •AGE
WUC 11110 WINDSHIELD **WUC 11111 WINDSHIELD PANEL**		
799 - NO DEFECT	Q - INSTALLED P - REMOVED	•INTERRELATED WITH OTHER HOW MAL CODES
846 - DELAMINATED 190 - CRACKED	P - REMOVED Q - INSTALLED R - REMOVE AND REPLACE	•MOISTURE PENETRATION •THERMAL STRESS •SOLAR RADIATION •FAULTY CONDUCTIVE COATING

Figure 10. T-39A Transparency System Failure Analysis Summary

TABLE 11. DESIGN IMPROVEMENT TRADE STUDY 1 — T-39A WINDSHIELD ANTI-ICING CONTROLLER REDESIGN

Present concept		Redesigned concept	
Item	10-yr life cycle cost	Item	10-yr life cycle cost
Field maintenance cost		Replacement cost	
Controller	$ 702,090	Nonrecurring - dvmt & qual	$ 125,420
Windshield	858,510	- T.O. revision	7,500
		Recurring - controller replacement	530,694
Special repair			
Controller	1,126,402	Field maintenance	
		Controller	242,869
Spares		Windshield	755,490
Windshield	231,200		
		Spares	
		Windshield	115,360
Total present concept cost	$2,918,202	Total redesigned concept cost	$1,777,333
10-year LCC saving			$1,140,869
Annual LCC saving		$114,087	

TABLE 12. COST ANALYSIS

T-39A WINDSHIELD TEMPERATURE CONTROLLER
COST STUDY
CURRENT UNIT (SCV-896-4) COST

PRESENT CONCEPT

FIELD MAINTENANCE FOR SPECIAL REPAIR		
WUC 41535		
Action taken code 1 (bench check NRTS)		323.3 hours
Field maintenance rate, controller (56,568 ÷ 2,593)	$	21.82 hours
Total field maintenance for special repair	$	7,054
Annual factor		0.6667
Annual special repair field maintenance	$	4,703/year
Escalation factor 1976-1983		1.419
Total annual special repair field maintenance	$	6,674/year
TOTAL 10-YEAR LCC SPECIAL REPAIR FIELD MAINTENANCE		$66,735
FIELD MAINTENANCE FOR OTHER THAN SPECIAL REPAIR		
WUC annual cost	$	56,568
Less special repair labor	$	4,703
Total field maintenance	$	51,865
Escalation factor 1978-1985		1.225
Annual field maintenance cost	$	63,535
TOTAL 10-YEAR LCC F/M FOR OTHER THAN SPECIAL REPAIR		$635,355
TOTAL 10-YEAR LCC CONTROLLER FIELD MAINT. COST		$702,090
WINDSHIELD FIELD MAINTENANCE	$	60,501
Escalation factor 1978-1983		1.419
Total annual windshield field maintenance	$	85,851
TOTAL 10-YEAR LCC WINDSHIELD FIELD MAINTENANCE		$858,510
SPECIAL REPAIR		
Average annual special repairs 1976, 1977		140 units
Average unit cost	$	567/unit
Special repair off-site costs per year	$	79,380
Escalation factor		1.419
TOTAL 10-YEAR LCC SPECIAL REPAIR COST		$1,126,402
WINDSHIELD SPARES	$	18,914
Escalation factor 1976-1983		1.225
Total annual windshield spares	$	23,120
TOTAL 10-YEAR LCC WINDSHIELD SPARES		$231,200
TOTAL PROJECTED PRESENT CONCEPT 10-YEAR LCC COST		$2,918,202

TABLE 12. COST ANALYSIS (Continued)

T-39A WINDSHIELD TEMPERATURE CONTROLLER

REDESIGNED CONCEPT

NONRECURRING

Total development and qualification costs (RI proposal to AF)		$125,420
Total technical order manual revisions ($35/hr x 214.3 hr)		$ 7,500
TOTAL NONRECURRING COST	$	132,920
REPLACEMENT WITH CSV2708-1 SOLID STATE		
Replacement cost		
1975 unit price (250 units production)	$	1,705.04
Escalation factor 1975-1978		1.245
1978 cost	$	2,127.77
250-unit production		250
Total Production (Recurring) Cost		$530,694
TOTAL RECURRING COST	$	530,694
FIELD MAINTENANCE COST		
Controller annual cost (less special repair)	$	51,865
On-aircraft 2,065 hr = 80% of total		
Off-aircraft maintenance 529 hr = 20% of total		
Cannibalization 437 ÷ 2,064 21.2% of 80% = 17%		
Total percentage of WUC deleted with new units = 17%		
Estimated reduction in field maintenance for solid-state devices (100% increase in MTBF) 50%		
Projected cost reduction in maintenance labor 50% $51,865	$	25,933
Total reduction in field maintenance costs	$	34,750
Remaining field maintenance costs (0.23 x $51,865)	$	17,116
Escalation factor 1976-1983		1.419
Projected annual cost for controller field maint	$	24,287
10-year LCC timespan		10
Total 10-year LCC controller field maintenance cost		$242,869
Windshield field maintenance		
Present concept field maintenance	$	85,851
Annual costs attributed to controller overtemp	$	10,304
Total projected 10-year LCC F/M ($85,851 - 10,304) x 10 =		$755,490
TOTAL 10-YEAR LCC FIELD MAINTENANCE COST	$	998,359

TABLE 12. COST ANALYSIS (Continued)

T-39A WINDSHIELD TEMPERATURE CONTROLLER

REDESIGNED CONCEPT

SPARES

Windshield spares		
Present concept spare cost		$ 23,120
Annual windshield replacement reduction		$ 11,584
Total projected 10-year LCC spares ($23,120-$11,584) x 10	=	$115,360
TOTAL 10-YEAR LCC WINDSHIELD SPARES		$ 115,360
TOTAL REDESIGNED CONCEPT COST		$ 1,777,333
TOTAL PRESENT CONCEPT COST		$ 2,918,202
TOTAL 10-YEAR LCC SAVING		$ 1,140,869
TOTAL ANNUAL LCC SAVING		$ 114,087

TABLE 12. COST ANALYSIS (Continued)

ESTIMATED T-39A WINDSHIELD MAINTENANCE
COST ATTRIBUTED TO THE TEMPERATURE
CONTROLLER FAILURE/MALFUNCTION

FIELD MAINTENANCE (TOTAL WUC'S 11111 AND 11110)

Total annual maintenance cost for:

WUC 11111 windshield glass panel	$	33,060
WUC 11110 windshield assembly	$	27,441
Total current field maintenance cost	$	60,501

ESTIMATED WINDSHIELD FIELD MAINTENANCE ATTRIBUTED TO CONTROLLER MALFUNCTION

WUC 11111 - W/S glass panel 33,060 x 0.12 =	$	3,967
WUC 11110 - W/S assembly 27,441 x 0.12 =	$	3,293
Total windshiled and panel maintenance	$	7,260
Escalation factor for 1976-1978		1.1587
Escalated labor to 1978		8,412
Total annual cost attributed to controller overtemperature	$	8,412
Escalation for 1978-1983		1.225
Total annual Field Maintenance cost attributed to controller overtemperature	$	10,304

TABLE 12. COST ANALYSIS (Concluded)

T-39A WINDSHIELD SPARES

ESTIMATED 33% REMOVE AND REPLACE FOR DELAMINATIONS DUE TO CONTROLLER MALFUNCTION

	Units	
WUC	2	
11111 W/S panel	12	
Total		14 units
Controller malfunction percentage		0.33
Controller malfunction units		5

ESTIMATED 50% REMOVE AND REPLACE FOR CRACKING DUE TO CONTROLLER MALFUNCTION

	Units	
WUC		
11110 W/S assembly	0	
11111 W/S panel	4	
Total		4 units
Controller malfunction percentage		0.5
Controller malfunction units		2

Total panels removed and replaced due to controller malfunction		7
Windshield panel unit cost	$	1,351
Total annual replacement cost due to controller malfunction	$	9,457
Escalation 1978-1983		1.225
Annual windshield replacement reduction	$	11,584

DESIGN IMPROVEMENT TRADE STUDY 2, KC-135A BOOM SIGHTING DOOR AND WINDOW REDESIGN

Problem

The boom door and sighting window is located on the lower centerline, of the aircraft, just to the rear of the refueling boom operator's station (figure 11). A window is completely removed from the aircraft, on a daily basis, to accomplish the necessary servicing. After removal, the window panel, as well as four separate fastener retainer strips, are layed on the ground. These parts are frequently inadvertently damaged by being blown away by the wind,stepped on, and run over by wheeled vehicles. The Airloc panel fasteners used to retain the window require frequent replacement of the studs and receptacles, due to wear and tear of the daily removal. A single, line crewmember can remove the window, although with some difficulty. However, when reinstalling the window, assistance of a second person is required, until the first few fasteners are secured. The failure fault tree and failure analysis summary for this door and window are shown in figures 12 and 13.

Proposed Revision

Incorporate a hinged window in lieu of a removable window and retain the panel fasteners to reduce maintenance costs.

Description of Change

In order to reduce the potential of damage of the window assembly, as well as reducing the man-hours required to gain access to the compartment, it is proposed to change the window installation to incorporate a hinge on the right-hand side, opposite the accumulator. Use a strut to hold the window in open position. The strut can be anchored to, as well as stowed on, the hydraulic actuator support beam that is centered on the door.

It is also recommended that the fastener retainer strips be combined into a "ring frame" and secured to the window assembly.

Investigation of quick-release panel fasteners reveals that although there are several fasteners that could replace the Airlocs presently used, there is no apparent advantage to be gained by making a change. See figure 11 for the proposed door configuration.

Cost Analysis

Tables 13 and 14 present a summary and a detailed breakdown of the costs involved in the modifying of the aircraft to incorporate this feature. The cost shown reflects maintenance requirements as established from the MAM's failure analysis and cost of material, labor rates, etc., as used in the Rockwell pricing process.

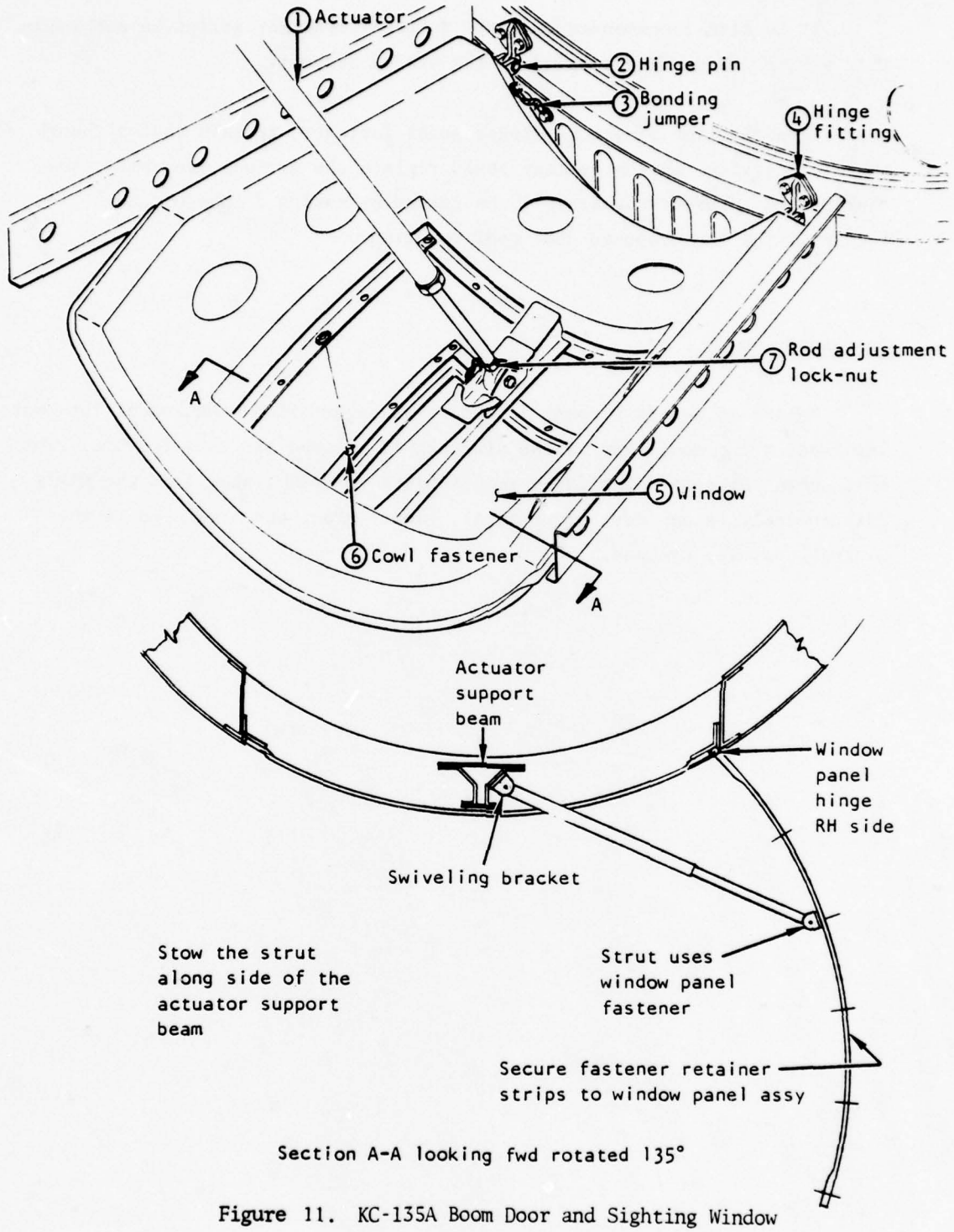


Figure 11. KC-135A Boom Door and Sighting Window

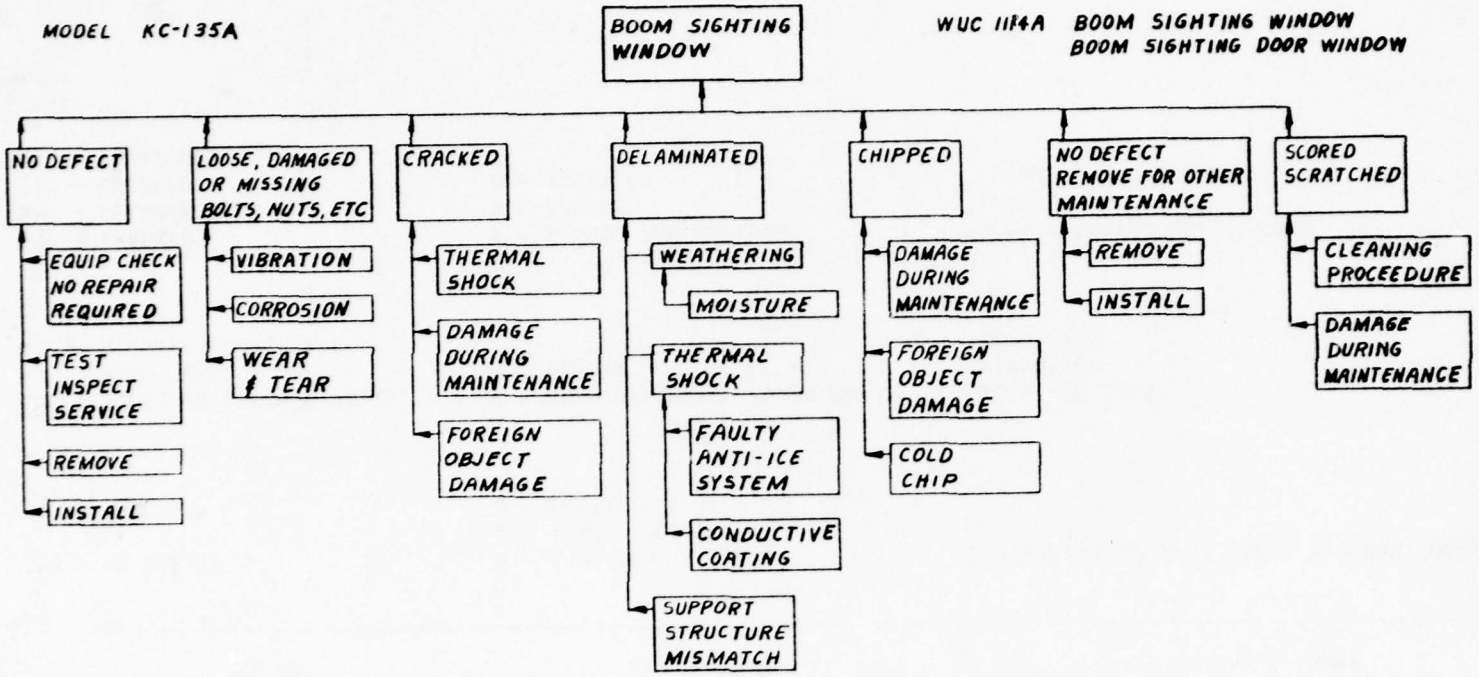


Figure 12. Fault Tree KC-135A Boom Sighting Window

WUC 114A BOOM SIGHTING WINDOW
BOOM SIGHTING DOOR WINDOW

HOW MAL	ACTION TAKEN	PROBABLE CAUSE
799 - NO DEFECT	H - EQUIPMENT CHECKED X - TEST, INSPECT, SERVICE Q - INSTALL	•INTERRELATED WITH OTHER HOW-MAL CODES
105 - LOOSE OR DAMAGED BOLTS, NUTS, ETC 106 - MISSING BOLTS, ETC	G - REPAIR/REPLACE MINOR PARTS F - REPAIR	•WEAR AND TEAR •VIBRATION •CORROSION
190 - CRACKED 846 - DELAMINATED 910 - CHIPPED 935 - SCRATCHED	R - REMOVE AND REPLACE P - REMOVE Q - INSTALL	•DAMAGE DURING MAINTENANCE •WEATHERING •CLEANING PROCEDURE

Figure 13. KC-135A Boom Sighting Window Failure Analysis Summary

TABLE 13. DESIGN IMPROVEMENT TRADE STUDY 2 – KC-135A BOOM DOOR AND SIGHTING WINDOW REDESIGN

Present concept		Redesigned concept	
Item	10-yr life cycle cost	Item	10-yr life cycle cost
Field maintenance		Replacement cost	
Boom door assy	$ 760,924	Nonrecurring - engrg & tooling	$ 27,080
		- TCTO	13,403
Spares		Recurring - boom door kits	45,440
Boom door assy	719,150	- boom door instl cost	116,100
		Field maintenance	
		Boom door assy	263,338
		Spares	
		Boom door assy	626,838
Total present concept	$1,480,074	Total redesign concept	$1,051,716
10-year LCC saving			$ 428,358
Annual LCC saving		$42,836	

TABLE 14. COST ANALYSIS

KC-135A BOOM DOOR AND SIGHTING WINDOW

PRESENT CONCEPT

FIELD MAINTENANCE COST DETERMINATION

Annual field maintenance window remove and replace		1,843 hr (1)
Field maintenance labor rate		10.71
Remove and replacement labor cost	$	19,735/year
Loose, missing, and damaged bolts and nuts (HMC 105, 106)		2,148 hours
Annual factor		0.6667
Annual field maintenance hours (HMC 105, 106)		1,432 hours
Field maintenance labor rate		10.71
Total field maintenance cost (HMC 105, 106)	$	15,340
Total field maintenance hours January 1976-June 1977		12,115 hours
Annual factor		0.6667
Annual hours		8,077 hours
Annual field maintenance cost	$	86,490
Average rate 1976 ($86,480 ÷ 8,077 hours)	$	10.71/hr
Current field maintenance cost boom sighting door window WUC 1114A		
Annual cost 1976	$	53,624 (1)
Escalation factor 1976-1983		1.419
Annual cost field maintenance	$	76,092
Expected fleet life		10 years
Total 10-year LCC field maintenance cost		$760,924

SPARES

Condemnation (spares) escalated to 1983 154 x $671 x 1.225 x 10 x 0.62 =	$	719,150 (2)
Total 10-year LCC boom door window		$719,150

TOTAL KC-135A 10-YEAR LCC PRESENT CONCEPT COST $1,480,074

(1) Total WUC 1114A includes the F/M hours and dollars for both the boom sighting window and boom door and sighting window. These estimates are corrected for the boom sighting window.

(2) Cost includes edge members, seals, fasteners, etc.

TABLE 14. COST ANALYSIS (Continued)

KC-135A BOOM DOOR AND SIGHTING WINDOW

REDESIGNED CONCEPT

NONRECURRING COST			
Total engineering and tooling costs (677 hr x $40/hr)			$27,080
TCTO revision			
Labor (377 hr x $35/hr)			$ 13,200
Material			$ 203
Total TCTO revision			$13,403
TOTAL NONRECURRING COST			$ 40,483

COST CALCULATIONS - BOOM SIGHTING WINDOW MODIFICATION KIT

Kit fabrication			
Purchased parts			
Hinge	18 inches at $22.00		$ 22
Rivets	50 at $00.02		1
Strut	at $ 5.00		5
			$ 28
Labor			
Cut hinge to length		0.2 hr	
Accumulate parts 0.52 piece		1.0 hr	
Inspect kit		0.5 hr	
Labor rate at		$30/hour	
Kit labor $			$ 52
Total kit cost			$ 80
Total aircraft			568
Total mod kits for 568 aircraft ($80 x 568 A/C) =			$45,440
Kit installation			
Remove window		1.0 hr	
Set up and drill hinge and window edge			
25 holes at 0.25 hr/hole		6.25 hr	
Modify RH window frame		2 hr	
Drill and install/25 rivets in window frame		6.25 hr	
Secure window (15 Airloc fasteners)		0.1 hr	
Total kit installation labor		14.6 hr	
Field maintenance labor rate		$14/hour	
			$ 204.40
Total kits			568
Total fleet installation cost		77	$116,100
TOTAL RECURRING COSTS			$ 161,540

TABLE 14. COST ANALYSIS (Continued)

KC-135A BOOM DOOR AND SIGHTING WINDOW

REDESIGNED CONCEPT (Continued)

FIELD MAINTENANCE COST (Boom Door Window)	
Total maintenance hours	1,733 (1)
Field maintenance rate	$ 10.71/hr
Field maintenance cost 1976-1977	$ 18,559
Escalation factor 1976-1983	1.419
Projected maintenance cost	$ 26,334
TOTAL 10-YEAR LCC MAINTENANCE COST	$263,338
SPARES	
Number of units	76 units (1)
Unit cost	$ 671/unit
Total spares cost	$ 51,178
Escalation factor 1978-1983	1.225
Total spares cost 1978-1988	$ 62,684
TOTAL 10-YEAR LCC SPARES COST	$626,838
TOTAL REDESIGNED CONCEPT COST	$1,051,716
TOTAL PRESENT CONCEPT COST	$1,480,074
TOTAL 10-YEAR LCC SAVING	$428,358
TOTAL ANNUAL SAVING	$42,836

(1) Includes WUC 1114A correction.

TABLE 14. COST ANALYSIS (Concluded)

KC-135A BOOM DOOR AND SIGHTING WINDOW

SPARES DETERMINATION

Current field maintenance cost $86,490[1]

WUC 1114A		Total Hr	R Code	Hours
HMC 190	Cracked	1,253.45	33	346.99
846	Delam	703.22	45	520.6
910	Chipped	478.98	33	410.84
935	Scratched	404.71	34	319.07
117	Deteriorate	392.74	31	104.15
70	Broken	388.25	16	20.5
730	Loose	69.94	2	10.0
900	Burned	59.01	12	59.01
605	Crazed	26.97	3	18.3
374	Failed	24	3	24
942	Misc	16	1	16
10		3.67	2	3.67
*Totals			215	1,853.13
				8.69 hours/R code

			Units	Hours		
No Defects	Action Taken					
HMC 799	T	Remove for cannibalization	13	19.19	1.48	
	R	Remove and replace	7	9.6	1.4	
*	U	Repl for cannibalization	16	30	1.88	
	H	Equipment check	1,816	1,751.75	0.96	
	P	Removed	1	0.5	0.5	
	Q	Installed	90	384.18	4.26	
			1,943	2,195.22	1.13	hours

Other Maintenance

HMC 800	S	Remove and reinstall	116	158.44	1.36
	P	Removed	136	116.15	0.85
	Q	Install	102	100.85	0.99
	R	Remove and replace	14	34.04	2.43
Totals			368	409.48	1.12

Total remove and replace units	2,526	4,459.83 x 0.6667	= 2,972.82
Total spares (18 months)	231	2,706	
Annual factor	0.6667		
Annual spares	154		

(1) WUC 1114A includes the field maintenance cost for both the boom sighting window and the boom door and sighting window. WUC 1114A BDSW = $86,490 - $32,866 = $53,624 (WUC 1114A distribution is 38 percent for boom sighting window, and 62 percent for boom door and sighting window).

DESIGN IMPROVEMENT TRADE STUDY 3, B-52G/H WINDSHIELD AND WINDOW REDESIGN

Problem

A survey of the B-52 reliability and maintainability data reveals that the windshield and windows shown in figure 14 account for 68 percent of the total cost of maintaining the B-52 transparency system. Of these failures, an estimated 30 percent are associated with delaminations, cracking, chipping, and deterioration of the panel assemblies. The six candidates include windshield panels numbers one through seven. The failures for these panels are depicted in figures 15 and 16 and summarized in figure 17. Discussions with ALC personnel state that a contributing factor to these types of failures are the windshield anti-icing controllers.

Proposed Revision

It is recommended that the following changes be incorporated in the B-52G/H transparency system for the purpose of reducing maintenance and logistical support costs.

1. Incorporate an improved flexible layer, a zee strip edge frame, and revise the edge sealing of the following windshield assemblies:

   a. 11DC6, No. 1 center windshield panel
   b. 11DCR, No. 2 LH and RH - main panels
   c. 11DCT, No. 3 LH and RH - sliding clear vision panels
   d. 11DC7, No. 4 LH and RH - side panels
   e. 11DC8, No. 5 LH and RH - aft side panels

2. Improve fastener attachment.

3. Incorporate improved controllers.

4. Revise instrument glare shield for access to fasteners.

Description of Change

Windshield panels 1, 2, 3, 4, and 5 are of similar construction (figure 18). The exterior and interior tempered glass laminates are bonded to a polyvinyl butyral interlayer. There is a metallic edge insert in the PVB interlayer. The PVB interlayer extends to the outer surface and serves as a bumper between the outer glass laminate and the windshield supporting structure. In addition, various parting agents and phenolic edge fillers are used. See figure 18.

When the windshield panels are installed, precured polysulfide strips are used for pressure seals. The strips are prepared by the maintenance personnel. Installation of the numbers 1 and 2 panels have used molded rubber gaskets on some aircraft. Polysulfide sealant is used to fill the gap between the outer surface of the panel and the supporting structure.

In order to reduce delamination and cracking that result from temperature variation, it is recommended that a 0.03 laminate of PPG 112, or equivalent, interlayer be used adjacent to each glass surface (figure 19) in place of a like amount of polyvinyl butyral. To provide an improved moisture barrier for the panel edge, use a heat vulcanized silicone seal along the edge of the outer glass laiminate and cover the edge with an overlapping metal "zee frame", and a polysulfide faying surface seal. Extend the polysulfide to seal all exposed edges of the panel assembly laminates. Extend the usage of molded silicone pressure seal gasket, to each of the windshield panel installations, and eliminate the precured polysulfide strips. Allow the environmental seal to not only fill the edge gap, but to overlap the adjacent structural members. Use bolt spacers to minimize stresses induced by overtorquing the installation bolts.

Another high-cost item, associated with the B-52 transparency system, is the windshield anti-ice temperature controller, work unit code 41 HAB. This single item accounts for 10.38 percent of the total transparency system logistic support cost. Two "How Mal?" codes, "internal failure", and "failed to operate" required approximately 38 percent of the cost of this item and resulted in 56 units removed and replaced in a 12-month period.

It is recommended that an updated solid-state temperature controller be incorporated into the windshield anti-ice system. It is estimated that usage of a more reliable temperature controller will not only substantially reduce the maintenance cost of the anti-ice system, but will, in addition, bring about a reduction in replacement of heated windshield panels.

Another high cost in maintenance hours that is attributed to this type windshield installation is gaining access to the lower panel attachment. Examination of aircraft of this type indicates that a readily removable instrument glare shield (total or partial) can be achieved by the incorporation of a splice or hinged arrangement. This modification will improve access to the windshield attaching fasteners.

Cost Analysis

The cost analysis for the proposed change is summarized in table 15. It presents the 10-year life cycle cost projected for the present concept as compared to the cost of redesign, requalification, retrofit, and reduced maintenance. Table 16 is a detailed cost analysis statement of the step-by-step assembly of logic and costing factors used to develop the cost trade.

The level of costs associated with condemnation and spares activity is not always fully defined in the K051 IROS data. Consequently, it was necessary to supplement this information from a buildup of spares replacement and cost from the MAM's analysis. This is shown in the current cost determination shown in table 16. Since this analysis represents a net variation in spares activity of current to projected, the application of this increment as applied to the current logistical costs is therefore considered to be valid.

The total nonrecurring cost developed for an improved windshield temperature controller to be used on the T-39A amounts to $132,920. Based on experience with the T-39A, it has been estimated that the development cost for a similar controller to be used on the B-52G/H will be $140,000.

The factors as applied in the costing or specific effort are described on page 44.

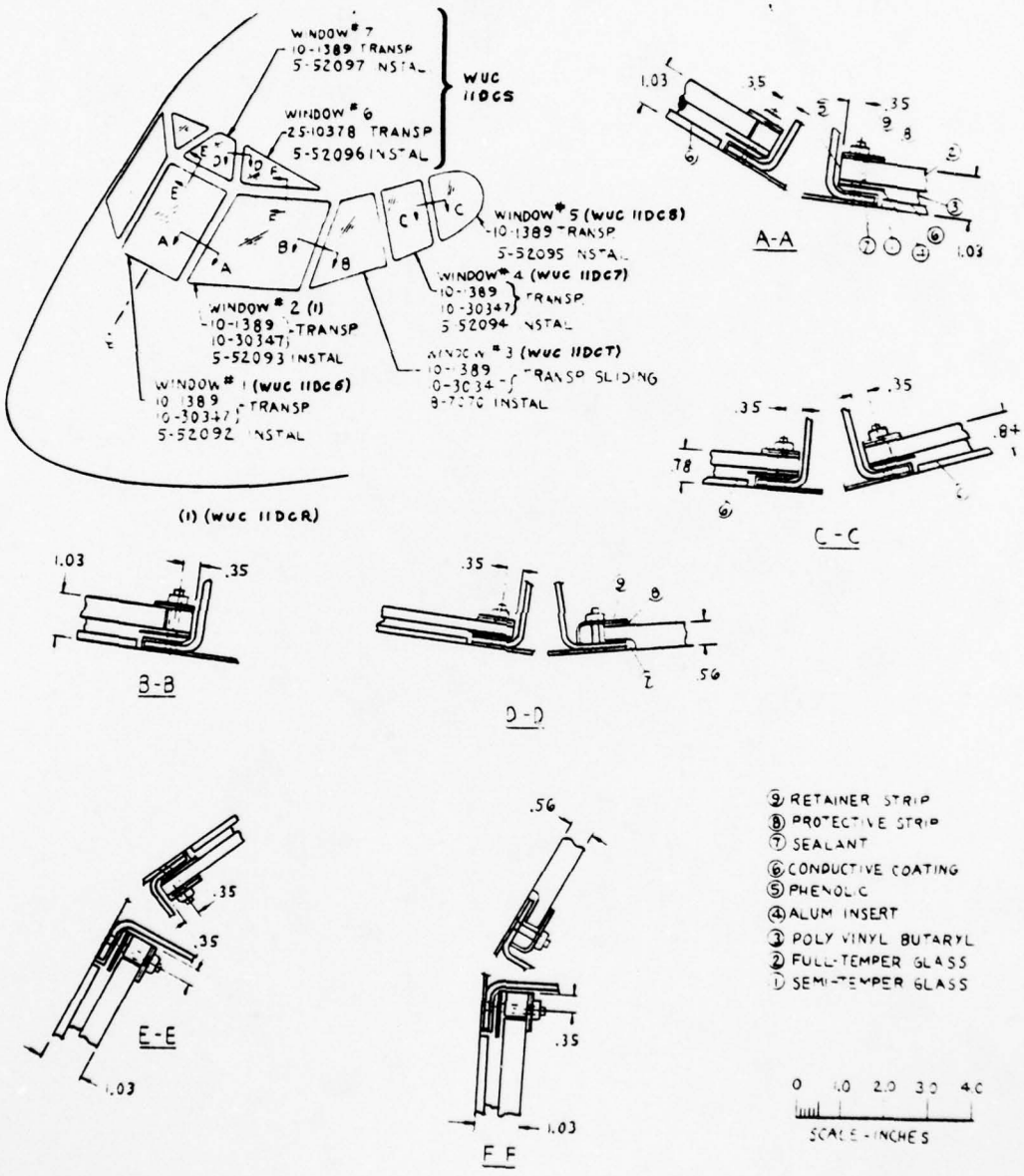


Figure 14. B-52G/H Windshields and Windows

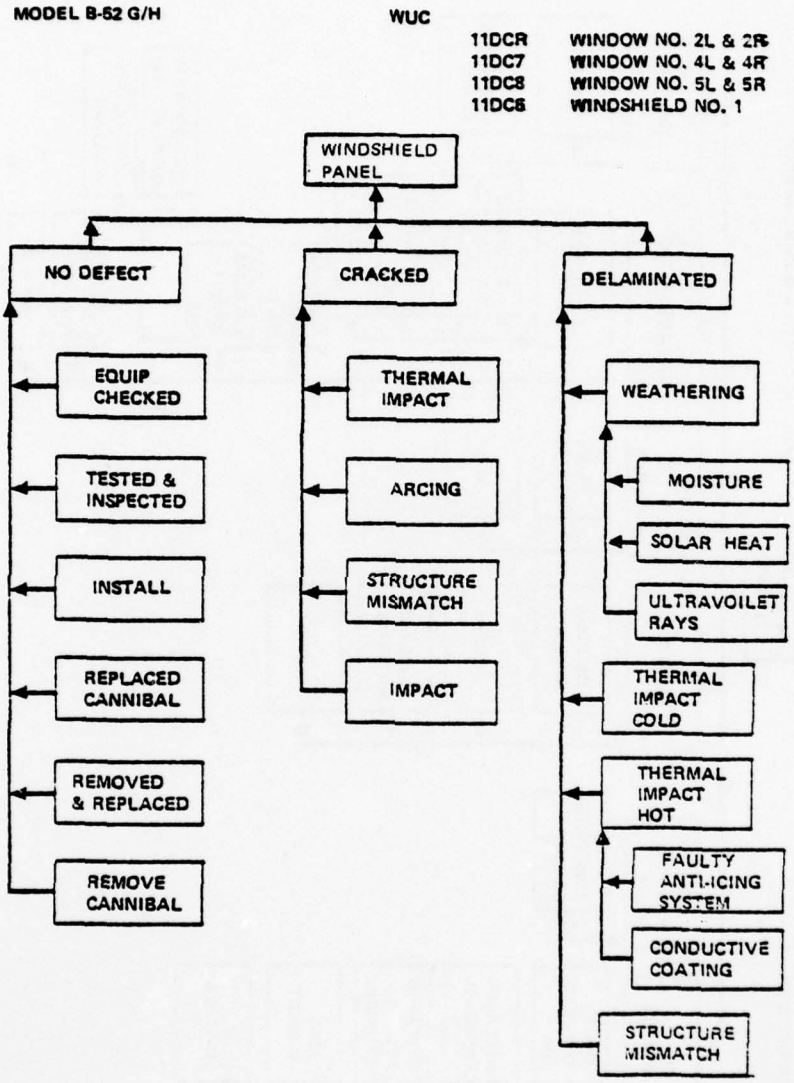


Figure 15. Fault Tree B-52 G/H Windshield Installation

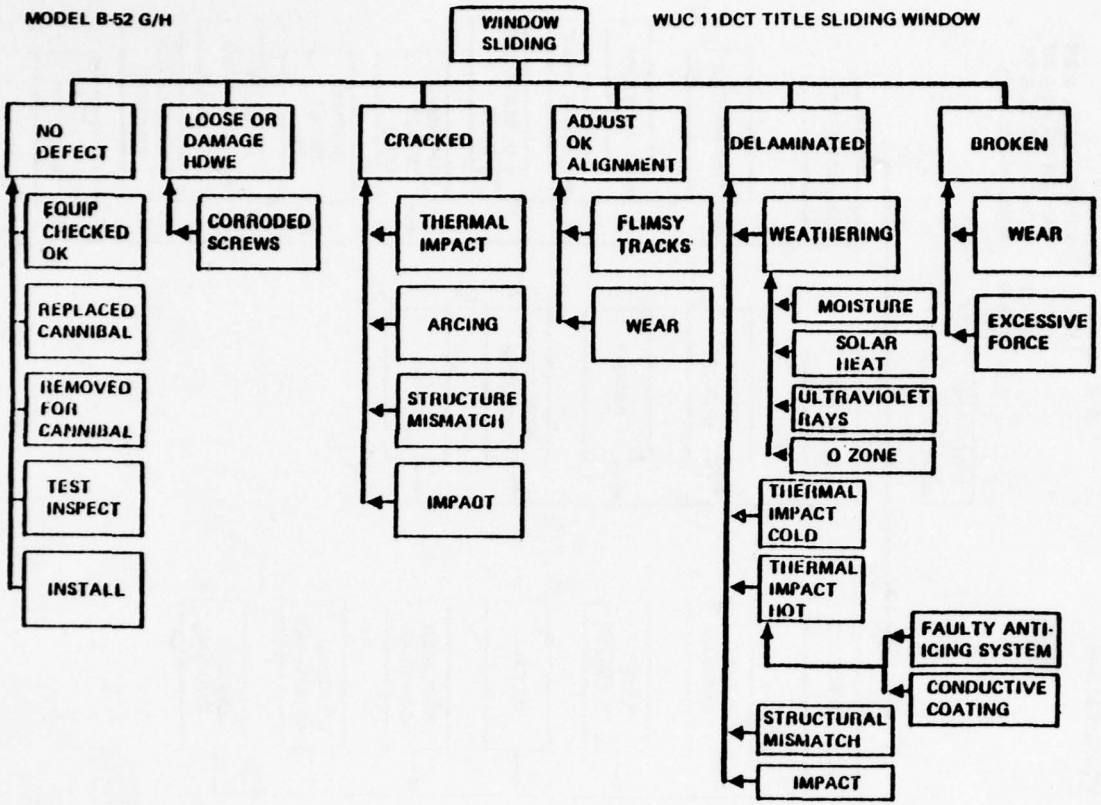


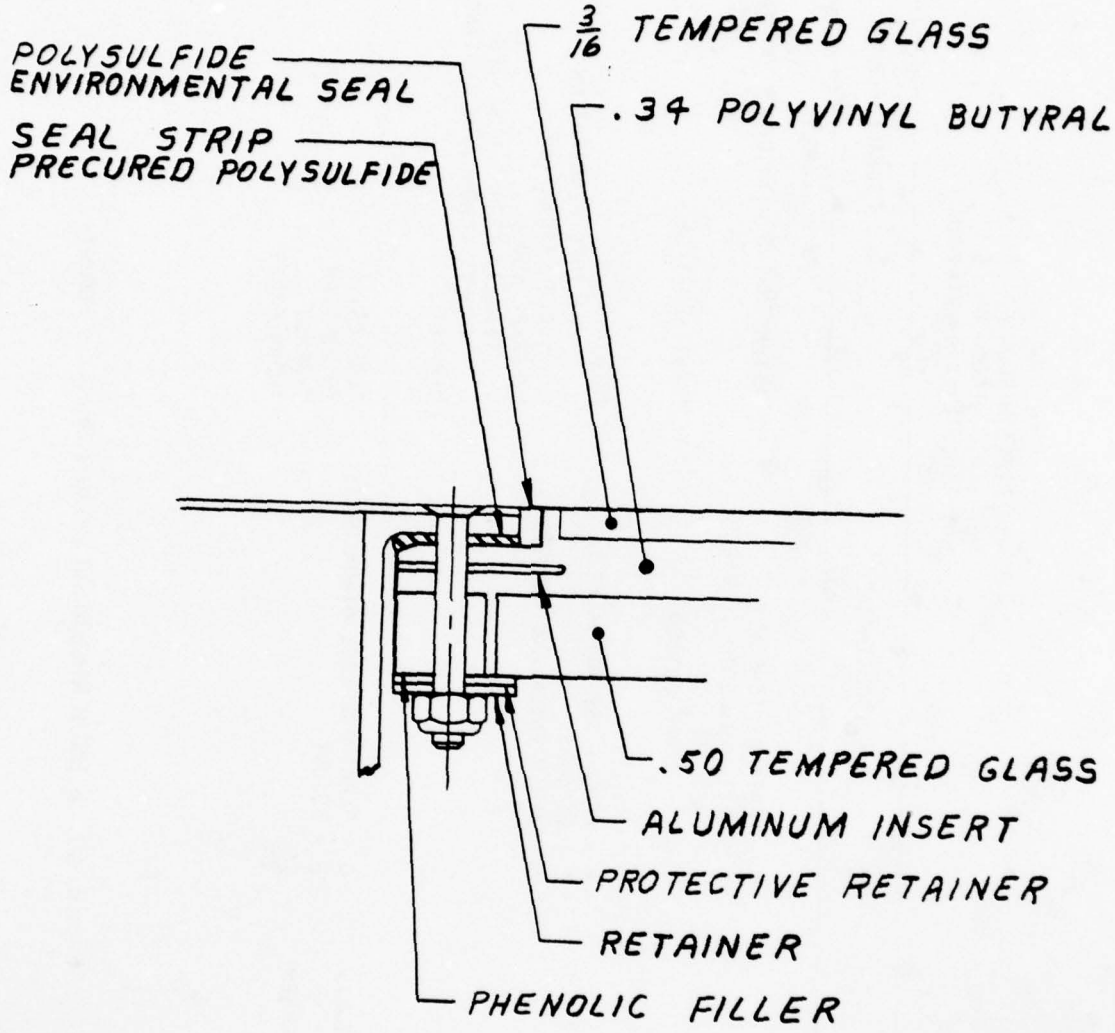
Figure 16. Fault Tree B-52 G/H Sliding Window

WUC 11DC6 WINDSHIELD NO. 1
WUC 11DCR WINDSHIELD NO. 2
WUC 11DCT SLIDING WINDOW

WUC 11DC7 WINDOW NO. 4
WUC 11DC8 WINDOW NO. 5
WUC 11DCS EYEBROW WINDOWS

HOW MAL	ACTION TAKEN	PROBABLE CAUSE
799 - NO DEFECT	H - EQUIPMENT CHECKED X - TEST, INSPECT, SERVICE Q - INSTALLED U & T - CANNABALIZED	•INTERRELATED WITH OTHER HOW-MAL CODES •PART SHORTAGE
846 - DELAMINATED 190 - CRACKED	R - REMOVE AND REPLACE P - REMOVAL 9 - BENCH CHECK AND CONDEMNED	•WEATHERING MOISTURE PENETRATION SOLAR RADIATION •THERMAL SHOCK FAULTY ANTI-ICE SYSTEM FAULTY CONDUCTIVE COATING •IMPACT
105 - LOOSE OR DAMAGED BOLTS, NUTS, ETC 127 - ADJUSTMENT OR ALIGNMENT IMPROPER	G - REPAIR/REPLACE MINOR PARTS L - ADJUST	•CORROSION •VIBRATION •IMPACT •WORN PARTS

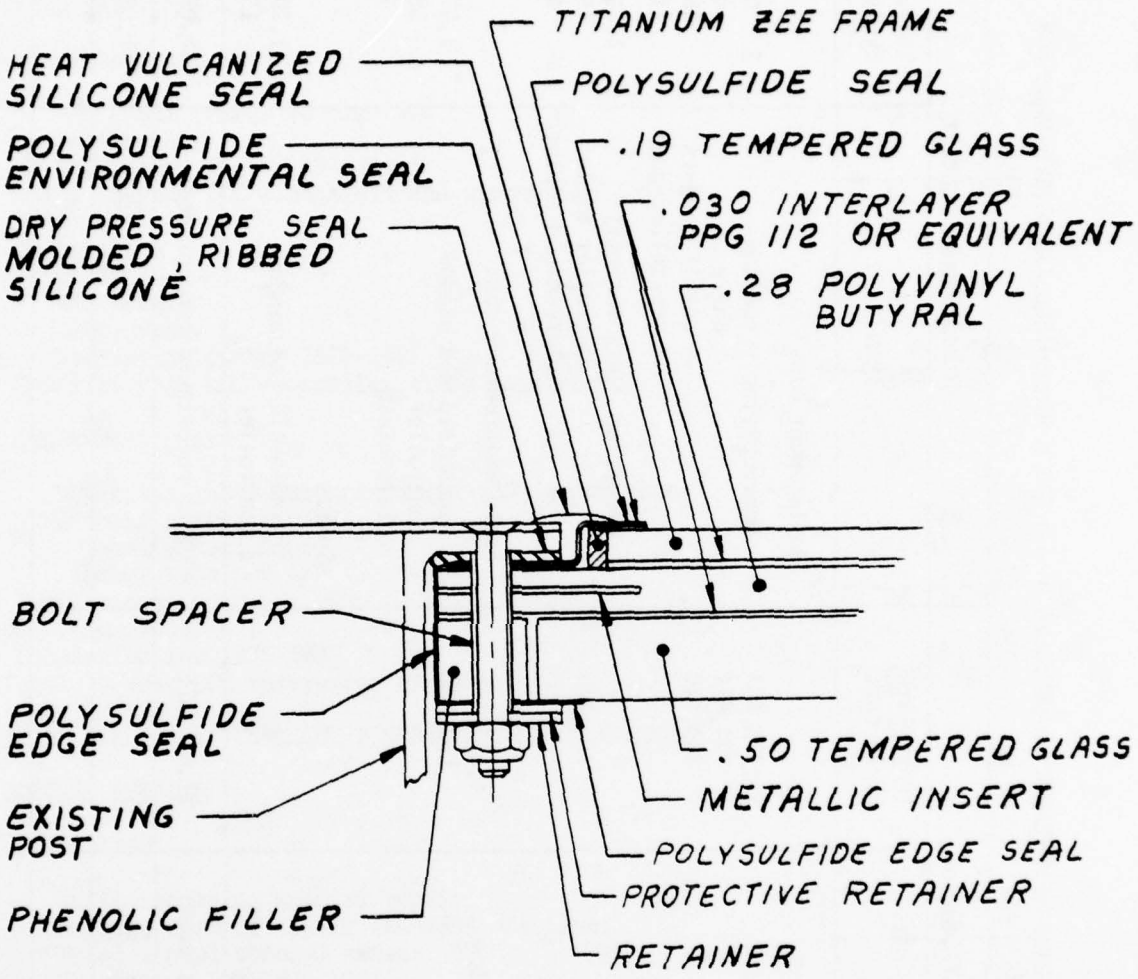
Figure 17. B-52G/H Windshield Failure Analysis Summary



TYPICAL FOR PANELS 1, 2, 3, 4, & 5

THICKNESS SHOWN FOR PANEL #2

Figure 18. B-52G/H Existing Windshield Configuration



TYPICAL FOR PANELS 1, 2, 3, 4, & 5

THICKNESS SHOWN FOR PANEL #2

Figure 19. B-52G/H Proposed Windshield Configuration

TABLE 15 DESIGN IMPROVEMENT TRADE STUDY 3 — B-52G/H WINDSHIELD AND WINDOW REDESIGN

Present concept		Redesigned concept	
Item	10-yr life cycle cost	Item	10-yr life cycle cost
Field maintenance cost		Replacement cost	
Windshield and window	$1,975,503	Nonrecurring - tooling	$ 66,700
Controller	774,064	- engrg	67,310
Glareshield	399,110	- certif & tests	283,500
		- controller qual	140,000
Special repair		Recurring - W/S retrofit	2,303,766
Controller	104,041	- controller replmt	194,175
		- glareshield replmt	46,217
Spares		Field maintenance cost	
Windshield and window	4,162,878	Windshield and window	1,078,625
Controller	199,980	Controller	387,032
		Glareshield	79,822
		Spares	
		Windshield and window	1,290,500
		Controller	155,339
Total present concept costs	$7,615,576	Total redesigned concept cost	$6,092,986
10-year LCC saving			$1,526,590
Annual LCC saving		$152,659	

TABLE 16. COST ANALYSIS

B-52G/H TRANSPARENCY SYSTEM

PRESENT CONCEPT

FIELD MAINTENANCE

Windshield and windows

WUC total (refer to page 99)	$ 139,218/yr
Total years	10
Escalation factor 1976-1983	1.419
Total 10-year LCC windshield and window field maint	$1,975,503

Controllers

WUC total	$ 54,550
Total years	10
Escalation factor 1976-1983	1.419
Total 10-year LCC controller field maintenance	$774,064

Instrument glare

WUC total labor per shield (KC-135A experience)	6 hr/unit
Total glare shields	335/unit
Total annual hours	2,010 hours
Labor rate per A/F	$ 14/hour
Total annual cost	$ 28,126
Escalation for 1976-1983	1.419 x 10
Total 10-year LCC instrument glare shield	$399,110

TOTAL PRESENT 10-YEAR LCC FIELD MAINTENANCE COST $ 3,148,677

SPECIAL REPAIR

Controller

Units requiring special repair	$ 39
Average cost of repair (KC-135A baseline)	$ 188
Total annual special repair	$ 7,332
Escalation for 1976-1983	1.419
Total annual cost	$ 10,404

TOTAL 10-YEAR LCC CONTROLLER SPECIAL REPAIR $104,041

TABLE 16. COST ANALYSIS (Continued)

B-52G/H TRANSPARENCY SYSTEM

PRESENT CONCEPT - Continued

SPARES

Windshields

WUC total (refer to page 99)	$ 293,367	
Total years	10	
Escalation	1.419	
Total 10-year LCC windshields and window spares		$4,162,878

Controllers

Total quantity spares/year (39 x 0.446)	17	
Unit cost	829	
Total annual cost	$ 14,093	
Total years	10	
Escalation	1.419	
Total 10-year LCC controller spares		$199,980
TOTAL SPARES AND SPECIAL REPAIR		$ 4,446,899
TOTAL B-52G/H 10-YEAR LCC SPARES, SPECIAL REPAIR, AND FIELD MAINTENANCE (PRESENT CONCEPT)		$7,615,576

TABLE 16. COST ANALYSIS (Continued)

B-52G/H TRANSPARENCY SYSTEM

REDESIGNED CONCEPT

NONRECURRING COST

Tooling			
(2) Strip			
PFP production flat pattern			10 hours
HDP hydropress die			150 hours
HTF heat treat fixture			60 hours
Molded silicone seal			
Mold			40 hours
SRD steel rule die			30 hours
Total tooling labor			290 hours
Tooling labor rate			$ 40/hour
Tooling labor dollars			$ 11,600
Tooling material at $6.00/hr (incl OH)			$ 1,740
Total tooling			$ 13,340
Total configurations			5
Total tooling for shipset			$66,700
Engineering			
Design			1,400 hours
TCTO			280 hours
Total engineering labor			1,680 hours
Engineering labor rate			$ 40/hour
Engineering labor			$ 67,200
Engineering material			$ 110
Total engineering			$67,310
Certification			
Engineering			$ 4,000
Testing			40,000
Panel fabrication (10 each)			12,700
637 + 340 + 46% new			
Current panel cost	$ 637		
Frame at 4 times boom sighting	340		
+ 46% new	293		
Total unit cost new	$1,270		
Total certification per panel			$ 56,700
Total certification	$56,700 x 5 config		$283,500
Total nonrecurring controller			$140,000
TOTAL NONRECURRING COSTS			$ 557,510

TABLE 16. COST ANALYSIS (Continued)

B-52G/H TRANSPARENCY SYSTEM

REDESIGNED CONCEPT - Continued

RECURRING COST

TOTAL ANNUAL FLIGHT HOURS		100,814 hours
TOTAL AIRCRAFT IN FLEET		262
AVERAGE ANNUAL FLIGHT HOURS PER AIRCRAFT		395 hr/yr
TOTAL SPARES REPLACEMENT (REPRESENTATIVE WINDSHIELD)		74 replacement
TOTAL AIRCRAFT IN FLEET		262
		3.54
MTBMA (334 x 3.54) CURRENT LIFE		1,363 hours
CURRENT AVERAGE FLIGHT HOURS/WINDSHIELD PPG 112 EQUIPPED DC-10 COMMERCIAL (2 at 13,000, 6 at 10,000, 3 at 8,000)		10,000 hours
PRIOR EXPERIENCE FOR COMMERCIAL/NON-PPG 112 EQUIPPED		3,500
REPLACEMENT FREQUENCY FACTOR		2.9
B-52 WINDOW CURRENT REPLACEMENT DURATION		3.2 yr
PROJECTED REPLACEMENT DURATION PPG 112 (2.9 x 3.5)		10.2 yr
REPLACEMENT FACTOR FOR B-52G/H TRANSPARENCY (10 ÷ 10.2)		0.98 per lifetime
FLEET REPLACEMENT COST PPG 112 MODIFIED TRANSPARENCIES ($977/UNIT x 9 UNITS/SHIP x 262 SHIPS) [$637 + ($633 x CUM AVG FACTOR FOR 500 UNITS ON A 92% CRC = $977]		$2,303,766
CONTROLLER REPLACEMENT		
Unit cost old component	$ 829	
Cost factor redesigned part (T-39 data)	0.73	
Recurring cost new unit	$ 605	
Fleet quantity	262	
Total fleet cost	$ 158,510	
Escalation factor 1978-1983	1.225	
TOTAL CONTROLLER REPLACEMENT COST		$194,175
FIELD MODIFICATION COST OF GLARE SHIELD		
Modification effort/unit glare shield	12.6 hr	
Labor rate	$ 14/hour	
Total labor	$ 176	
Total units	262	
TOTAL FIELD MODIFICATION OF GLARE SHIELD COST		$46,217
TOTAL RECURRING COST		$ 2,544,158

AD-A068 721 ROCKWELL INTERNATIONAL EL SEGUNDO CA LOS ANGELES DIV F/G 1/3
AIRCRAFT TRANSPARENCY FAILURE AND LOGISTICAL COST ANALYSIS. VOL--ETC(U)
DEC 78 S S BROWN F33615-77-C-3060
UNCLASSIFIED NA-78-604-VOL-3 AFFDL-TR-78-153-VOL-3 NL

2 OF 4
AD A068721

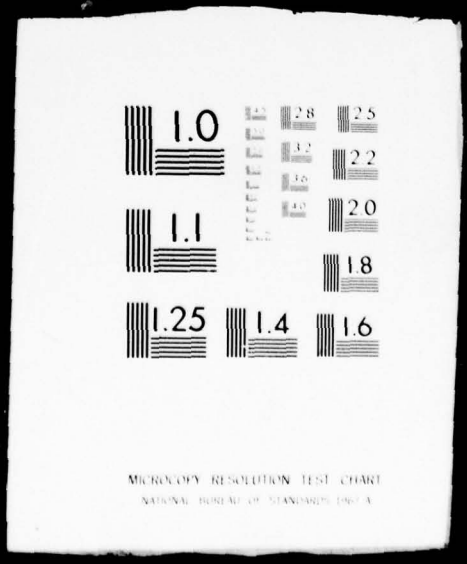


TABLE 16. COST ANALYSIS (Continued)

B-52G/H TRANSPARENCY SYSTEM

REDESIGNED CONCEPT - Continued

FIELD MAINTENANCE COST

WINDSHIELD AND WINDOW		
Current cost	$	139,218
Reduction for MTBMA improvement DDCC		0.65
		90,462
Reduction for improved controller (1.0-0.16)		0.84
Total field maintenance for windshields per year	$	76,013
Total time		10 yr
Escalation		1.419
TOTAL WINDSHIELD FIELD MAINTENANCE COST		$1,078,625
CONTROLLER		
Current controller cost	$	54,550
Reduction for increased MTBF		0.5
Total field effort per year		27,275
Total timespan		10
Escalation		1.419
TOTAL CONTROLLER FIELD MAINTENANCE COST		$387,032
INSTRUMENT GLARE SHIELD		
Current cost 10 years	$	399,110
Reduction in cost for redesign		0.2
TOTAL INSTRUMENT GLARE SHIELD		$79,822
TOTAL 10-YEAR LCC FIELD MAINTENANCE COST	$	1,545,479
SPARES REQUIRED FOR NON-DDCC ACTIVITIES		
WINDSHIELD SPARES REQUIREMENTS ANNUALLY	$	293,367
Non-DDCC spares factor		0.31
Total non-DDCC spares required annually		90,944
Escalation factor 1976-1983		1.419
Escalated annual cost of other spares		129,050
Total life cycle		10
TOTAL 10-YEAR LIFE CYCLE COST FOR OTHER SPARES		$1,290,500
SPARES REQUIRED FOR DDCC ACTIVITY CODES [(1.8-1.0) $194,175]	=	$155,339
TOTAL WINDSHIELD AND WINDOW SPARES	$	349,415

TABLE 16. COST ANALYSIS (Continued)

B-52G/H TRANSPARENCY SYSTEM

REDESIGNED CONCEPT - Continued

CONTROLLER SPARES	
Replacement factor (ref T-39) (3.6 x 0.5) = 1.8	
Spares factor = (1.8-1.0) = 20.8	
Total controller spares = 0.8 x $1,941,752	$155,339
TOTAL 10-YEAR LCC SPARES COSTS	$ 1,445,839
TOTAL REDESIGNED CONCEPT COST	$6,092,986
TOTAL PRESENT CONCEPT COST	$7,615,576
TOTAL 10-YEAR LCC SAVING	$1,526,590
TOTAL ANNUAL LCC SAVING	$ 152,659

TABLE 16. COST ANALYSIS (Concluded)

B-52G/H TRANSPARENCY SYSTEM

CURRENT COST DETERMINATION

	Field Maintenance Cost		Spares			
WUC	Hours	Dollars	Rate	Units	Cost/ Unit	Total Cost
11DC6	1,159.9	12,441		43	861	37,023
11DC7	2,174.8	23,028		81	604	48,924
11DC8	2,552.4	21,111		101	501	50,601
11DCR	2,555.3	36,186		81	976	79,056
11DCT	4,491.5	46,452		147	529	77,763
Total	12,933.9	139,218	$10.43	372		293,367
Average					694	

How Mal Codes for Delamination, Deterioration, Chipping, and Cracking

WUC HMC/Units	11DC6	11DC7	11DC8	11DCR	11DCT	Total
846	16	68	72	34	36	261
117	1	2	1	7	12	25
910	-	7	17	2	19	55
190	16	17	37	41	62	202
Total DDCC	33	94	127	84	129	467
Total units	64	121	151	121	220	677
DDCC %	52	78	84	69	59	69

WUC HMC/Units	41HAB	Special Repair Determination Action Taken Code	
374	43	57.78	hours
160	3	5.75	
20	2	4.0	
450	2	3.0	
615	5	6.25	
169	2	2.00	
255	1	2.83	
	58	81.61	hours
	0.6667		
	39	54.41	hours/year

DESIGN IMPROVEMENT TRADE STUDY 4, C-141A WINDSHIELD REDESIGN

Problem

A review of the reliability and maintainability data for the C-141A aircraft (figure 20) reveals that approximately 30 percent of the cost of maintaining the windshield results from cracks, delamination, scratches, and chipping. The failures for these panels are shown in figure 21 and summarized in figure 22.

Proposed Revision

In the interest of reducing this high-cost maintenance problem, it is recommended that the following changes be incorporated in the C-141A transparency system.

1. Incorporate an improved flexible interlayer, a zee strip edge frame, and revise the edge sealing of the following windshield assemblies:

   a. 11AAA, center windshield panel
   b. 11AAB, pilot's main panel - LH
   c. 11AAU, copilot's main panel - RH
   d. 11AAD, LH and RH - sliding clear vision panels
   e. 11AAC, LH and RH - side panels

2. Improve fastener attachments.

3. Revise instrument glare shield for access to fasteners.

Description of Change

The seven windshield panels involved fall into two general categories. The center and two forward panels are fabricated of tempered glass laminates

bonded to polyvinyl butryl interlayers. (See figures 23 and 24.) The left- and right-hand fixed side panels as well as the left- and right-hand, sliding, clear-vision panels are made out of stretched acrylic laminates bonded to polyvinyl butryl interlayers. (See figures 27 and 28.)

All of the windshields, including the sliding clear vision panel, are installed with a cast-in-place faying surface seal.

Cracking and delamination account for a major portion of the glass-PVB panel malfunctions. In order to reduce maintenance effort associated with these panels, the following changes are suggested. (See figures 25 and 26.) Use a 0.030 laminate of PPG 112, or equivalent, interlayer to replace a like amount of the polyvinyl butryl adjacent to each glass surface. In order to provide an improved moisture barrier replace the adhesively bonded polysulfide bumper strip with a heat vulcanized silicone seal and enclose the outer edge with a metal "zee" frame and polysulfide faying surface seal. Extend the polysulfide seal to protect all exposed edges of the panel assembly. To reduce the time required to install the panel assemblies, use a dry, molded, ribbed silicone pressure seal rather than the formed-in-place polysulfide faying surface seal. To minimize installation stress resulting from over torquing bolts, coordinate the length of the bolt spacers with the design of the panel and the pressure seal. To reinforce environmental sealing, allow the aerodynamic seal to overlap the adjacent members.

Regarding the acrylic-PVB panels, scratches and chipping, in addition to cracks and delaminations, account for many malfunctions. Leaking is a cost contributor for the sliding, clear vision windshield panel. It is recommended that the PPG-112 (or equivalent) interlayer and the polysulfide edge seal be used with these panels for the same reasons as for their use with the glass-PVB panels. It is also recommended that the molded silicone pressure seal be used with the fixed side panel. (See figure 30.) Inasmuch as the outer acrylic laminate is continuous and overlaps the supporting structure, there is no need to use the "zee" frame with these panels.

A proposed environmental and pressure seal for the sliding, clear view windshield is shown in figure 29. The edge of the seal land and the panel rebate are modified to minimize scrubbing when the panel is opened and closed. A silicone faying surface seal is formed in place to accommodate manufacturing and installation tolerance accumulation. The silicone seal is formed over a temporary spacer in the area of the pressure seal. Later an extruded neoprene pressure seal is bonded to the land structure. It is designed to provide an interference fit with the faying surface seal.

To reduce the damage of the acrylic surfaces due to abrasion, use a scratch-resistant coating such as Serracin HC-1B (or equivalent) on both the inner and outer surfaces. (See figures 29 and 30.)

Another very high cost in maintenance hours item that is attributed to this type windshield installation is gaining access to the lower panel attachment. Examination of aircraft of this type indicates that a readily removable instrument glare shield (total or partial) can be achieved by the incorporation of a splice or hinged arrangement. This modification will eliminate the necessity of splicing wire bundles.

Cost Analysis

The cost analysis for the proposed change is summarized in table 17. It presents the 10-year life cycle cost projected for the present concept as compared to the cost of redesign, requalification, retrofit, and reduced maintenance. Table 18 is a detailed cost analysis statement of the step-by-step assembly of logic and costing factors used to develop the cost trade.

The level of costs associated with condemnation and spares activity is not always fully defined in the K051 IROS data. Consequently, it was necessary to supplement this information from a buildup of spares replacement and cost from the MAM's analysis. This is shown in the current cost determination shown in table 18. Since this analysis represents a net variation in spares activity of current to projected, the application of this increment as applied to the current logistical costs is therefore considered to be valid.

The factors as applied in the costing or specific effort are described on page 44.

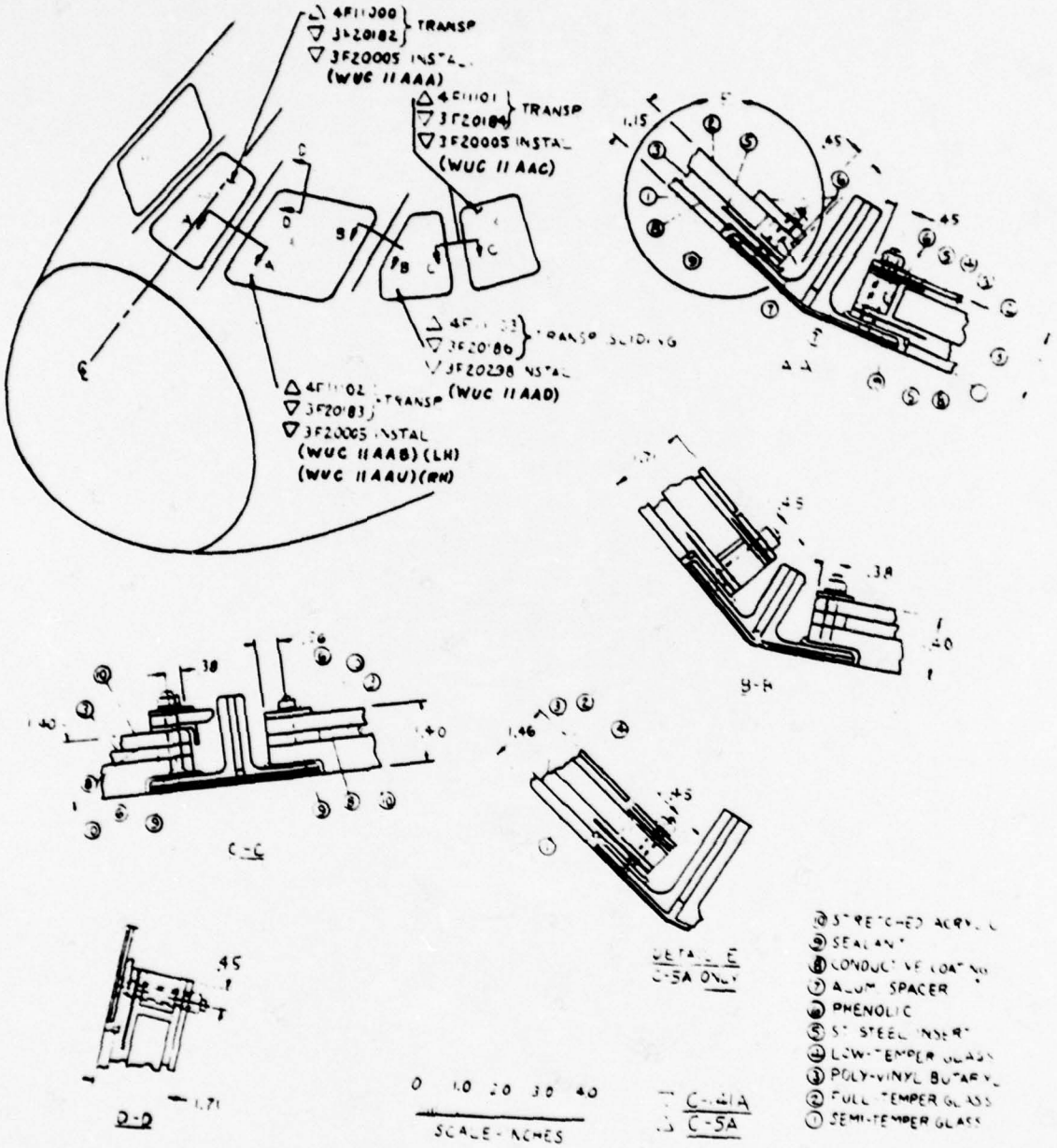


Figure 20. C-141A Windshields

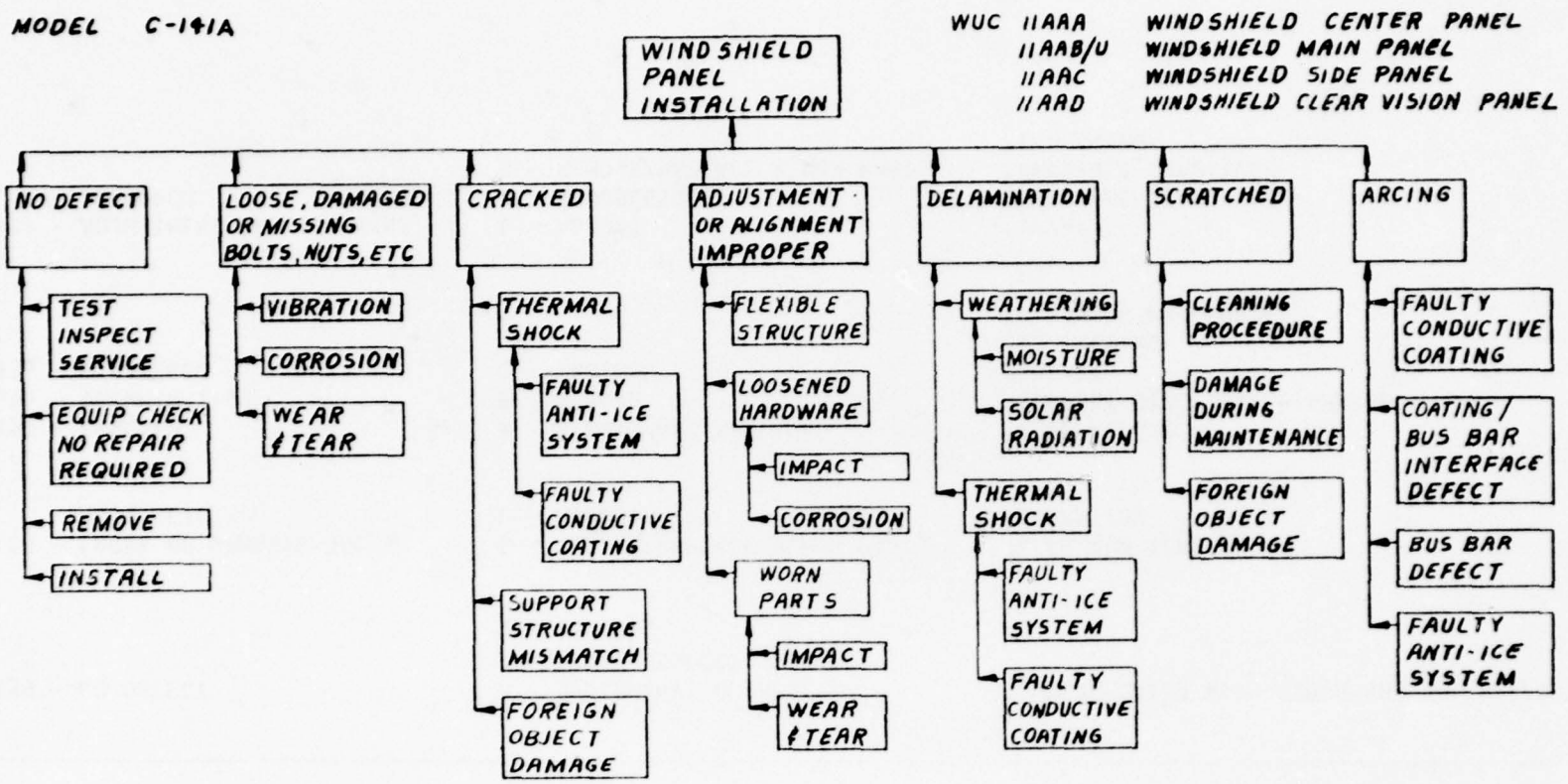


Figure 21. Fault Tree C-141A Windshield Installation

WUC 11AAA	WINDSHIELD CENTER PANEL	WUC 11AAC	WINDSHIELD SIDE PANEL
WUC 11AAB/U	WINDSHIELD MAIN PANEL	WUC 11AAD	WINDSHIELD CLEAR VISION PANEL

HOW MAL	ACTION TAKEN	PROBABLE CAUSE
799 - NO DEFECT	H - EQUIPMENT CHECKED X - TEST, INSPECT, SERVICE Q - INSTALL	•INTERRELATED WITH OTHER HOW-MAL CODES
105 - LOOSE OR DAMAGED BOLTS, NUTS, ETC	G - REPAIR/REPLACE MINOR PARTS L - ADJUST	•WEAR AND TEAR •VIBRATION
190 - CRACKED 846 - DELAMINATION 935 - SCRATCHED	R - REMOVE AND REPLACE P - REMOVE Q - INSTALL	•THERMAL SHOCK •SUPPORT STRUCTURE MISMATCH •IMPACT •WEATHERING •CLEANING PROCEDURE
127 - ADJUSTMENT OR ALIGNMENT IMPROPER	L - ADJUST Y - TROUBLESHOOT G - REMOVE/REPLACE MINOR PARTS	•IMPACT •WEAR AND TEAR •FLEXIBLE STRUCTURE •CORROSION

Figure 22. C-141A Windshield Failure Analysis Summary

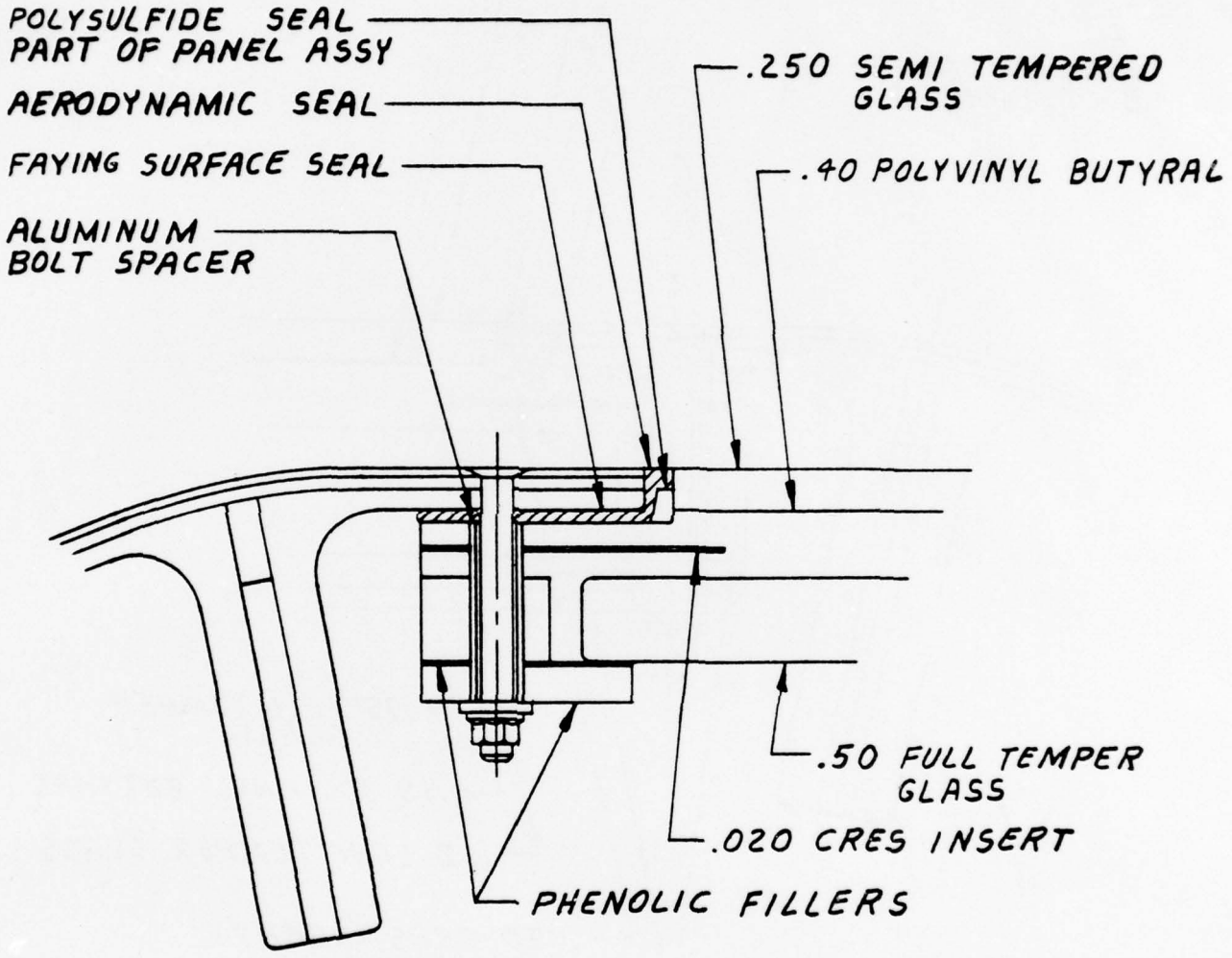


Figure 23. C-141A Existing Center Panel Configuration

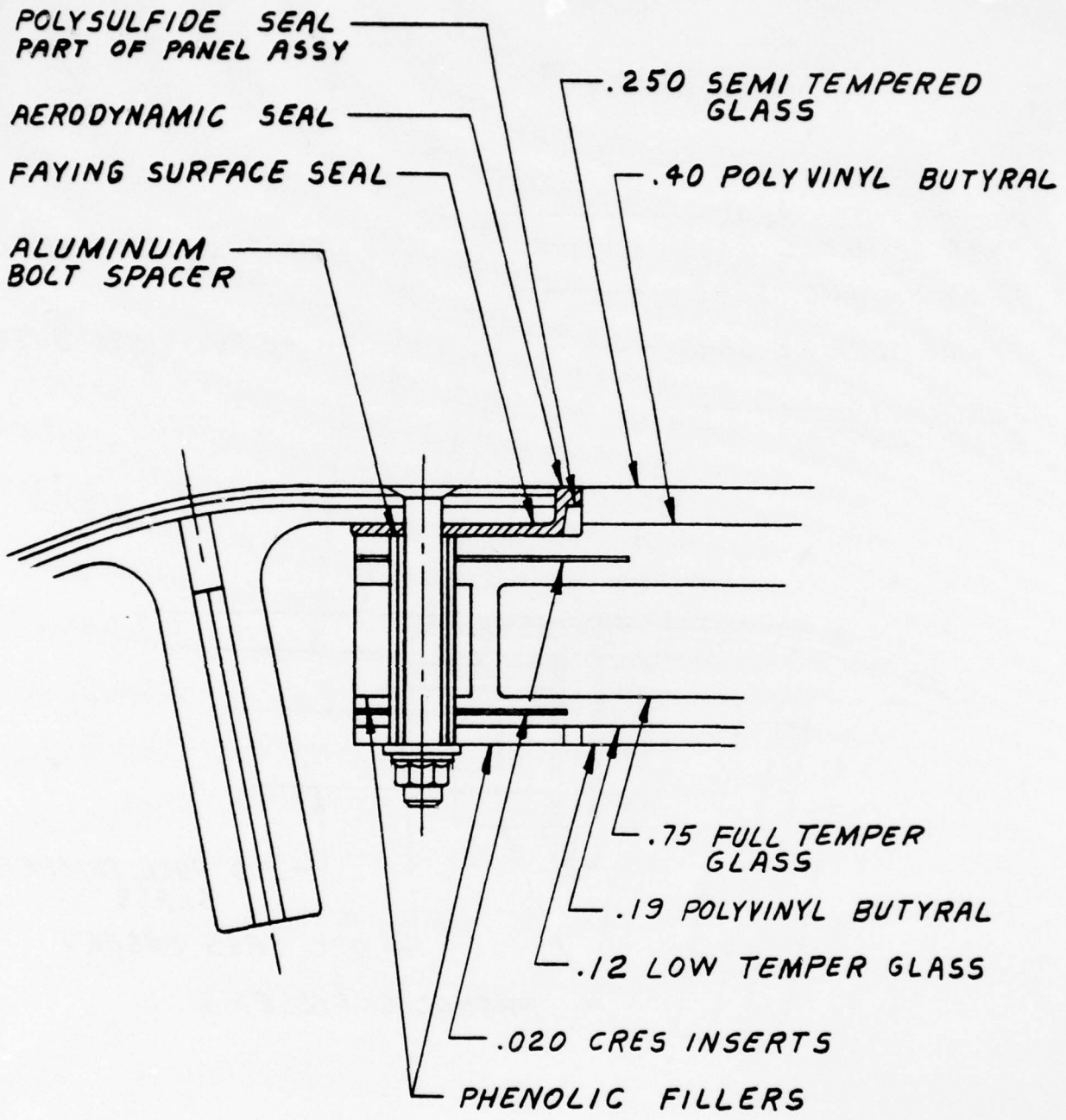


Figure 24. C-141A Existing Main Panel Configuration

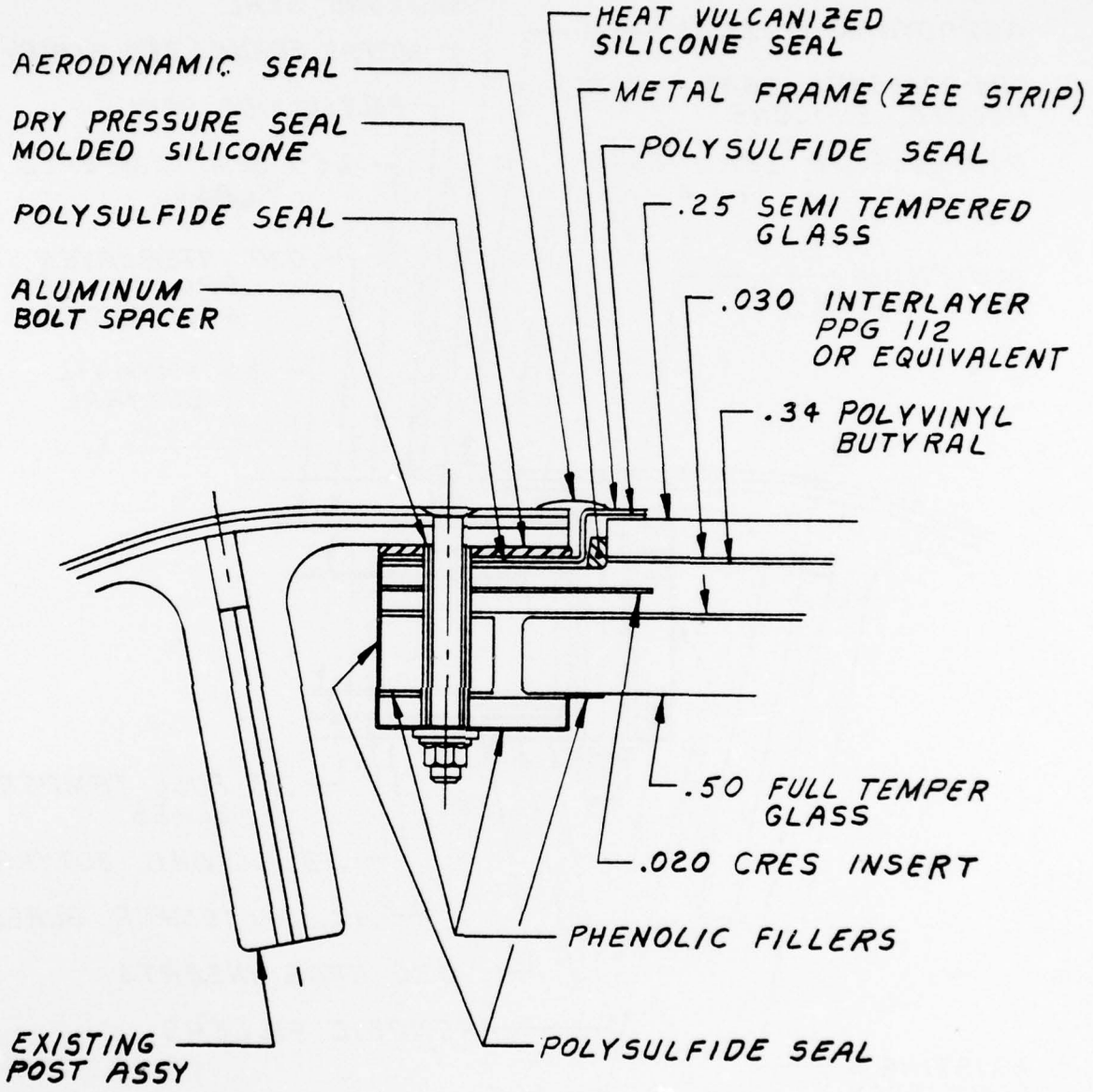


Figure 25. C-141A Proposed Center Panel Configuration

Rear canopy

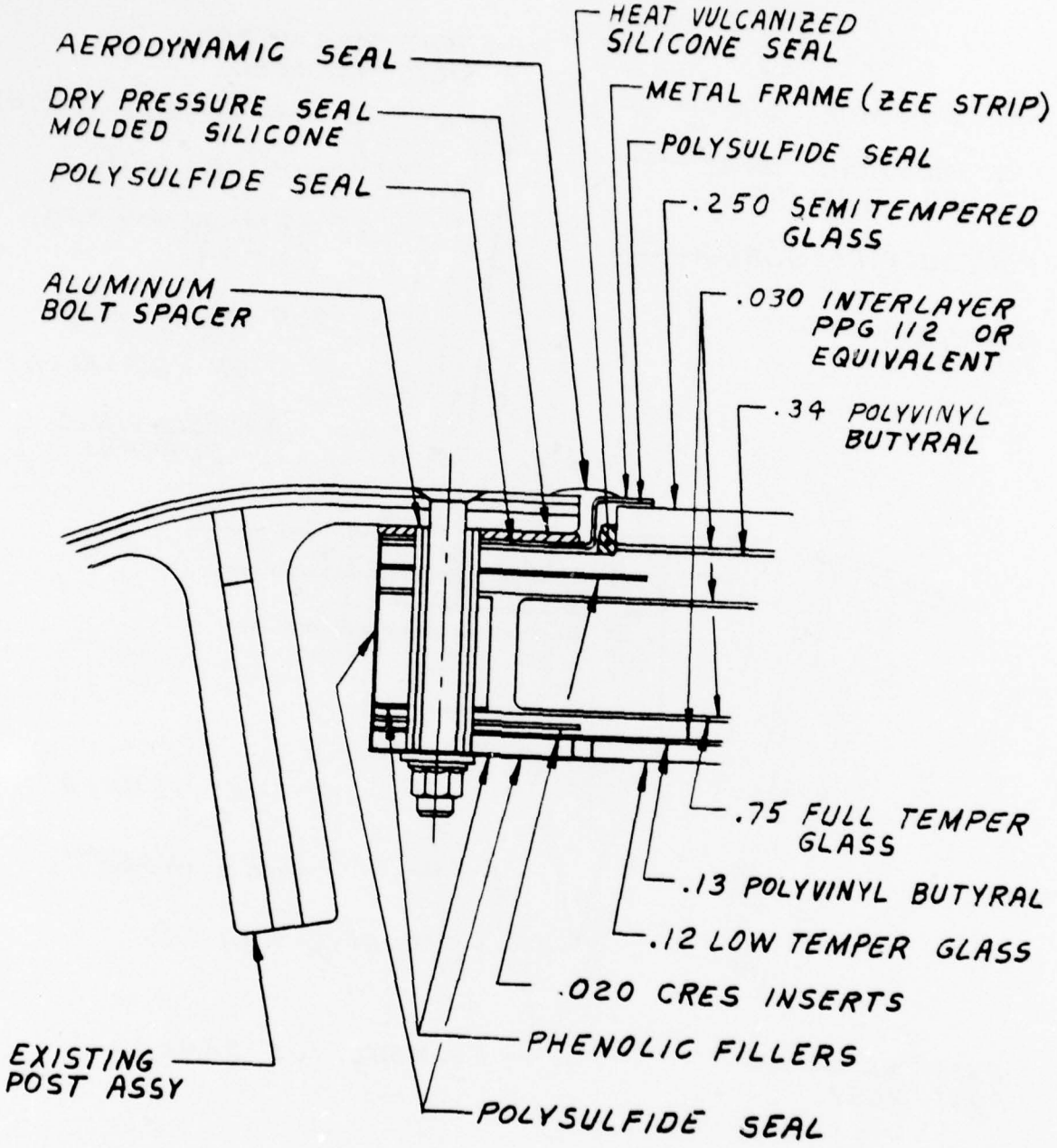


Figure 26. C-141A Proposed Main Panel Configuration

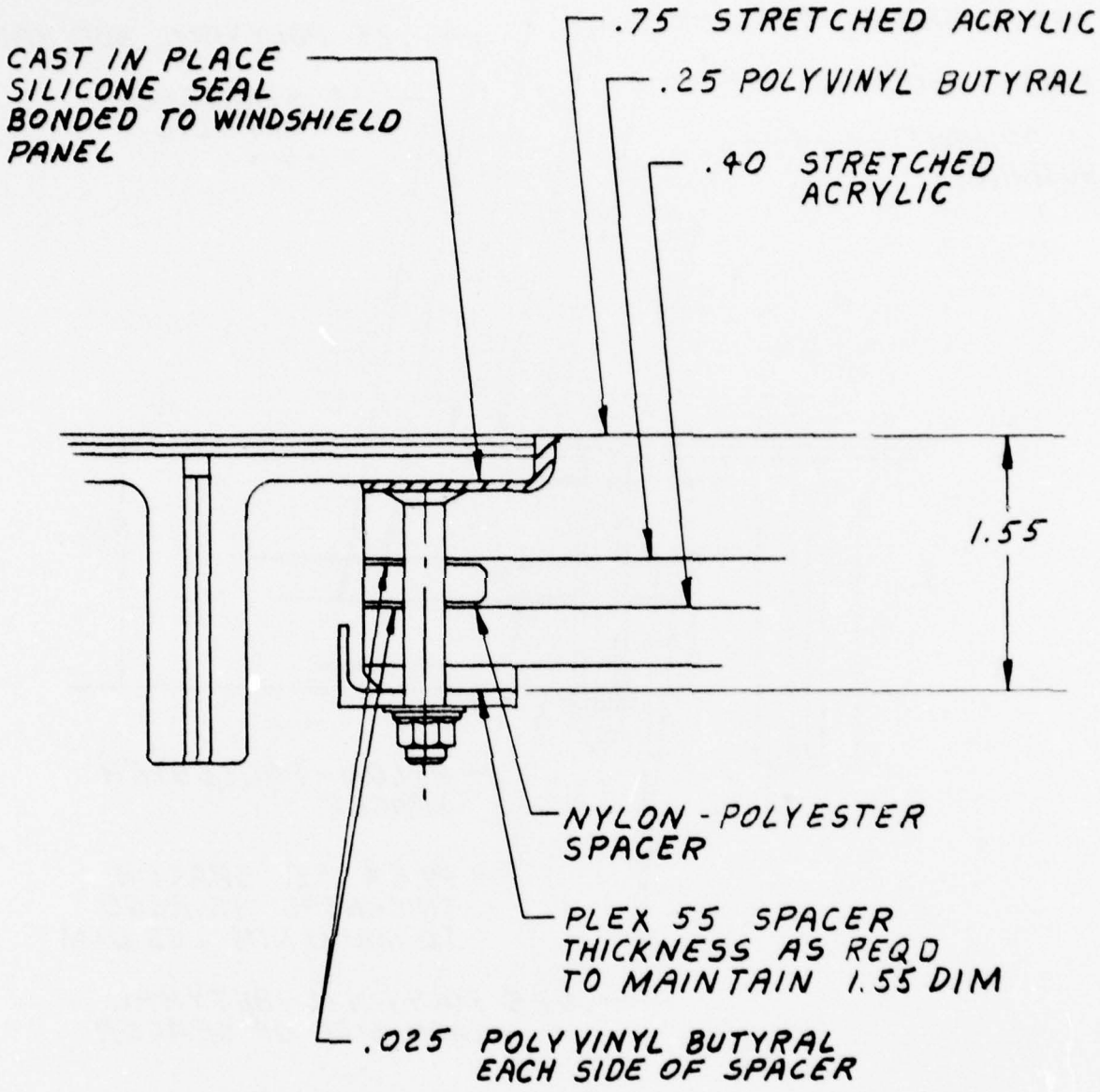


Figure 27. C-141A Existing Clear Vision Panel Configuration

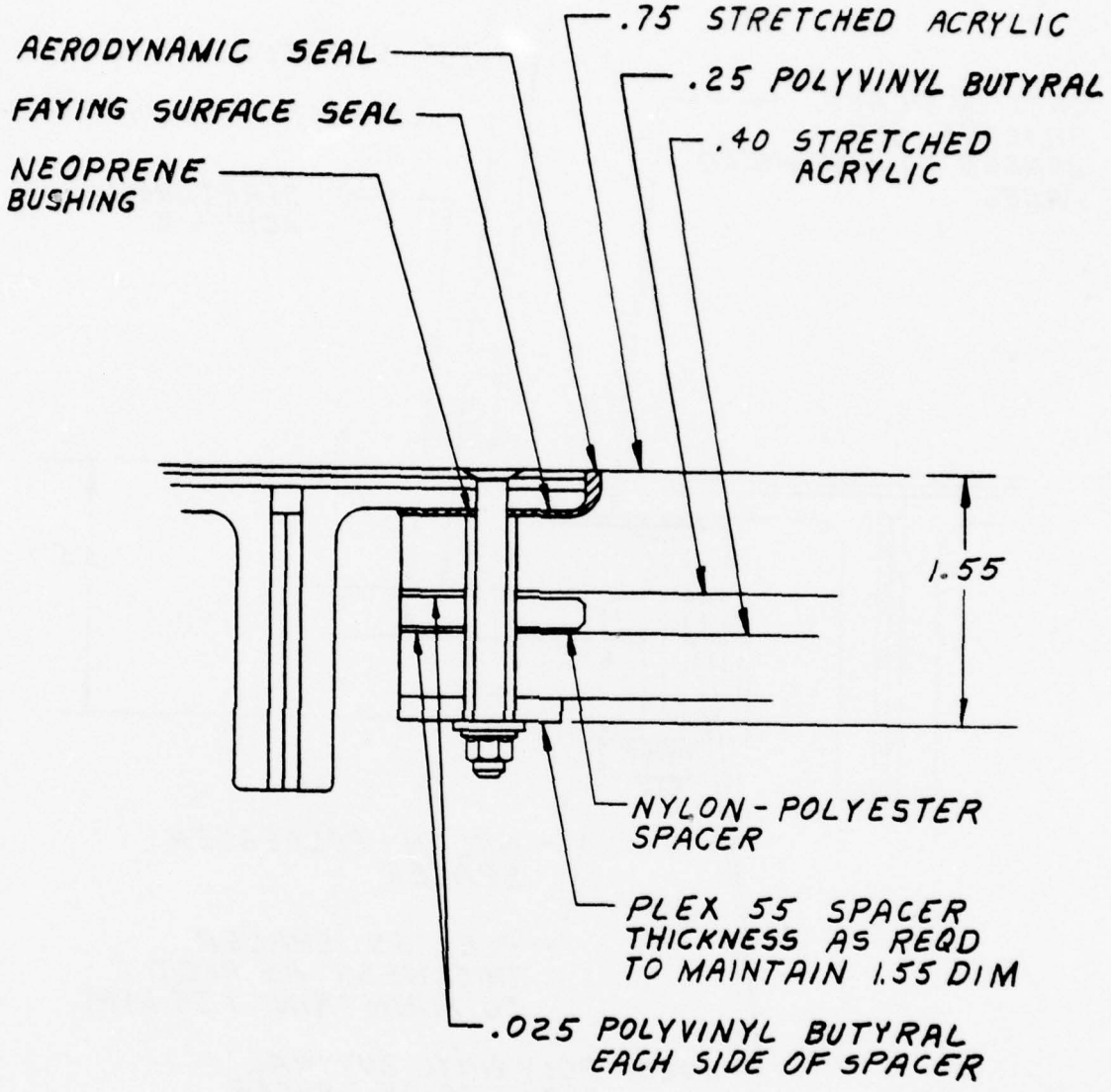


Figure 28. C-141A Existing Side Panel Configuration

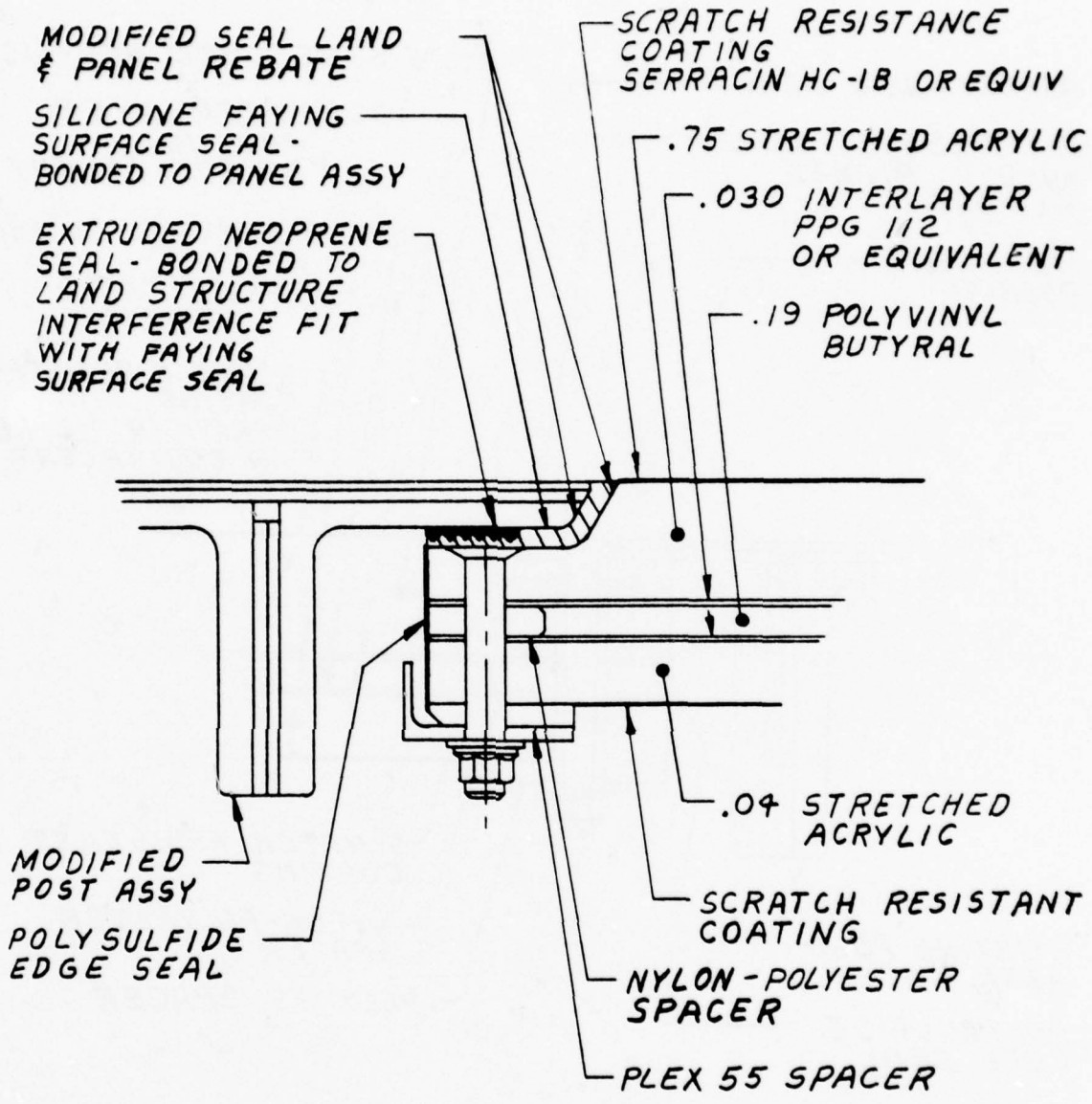


Figure 29. C-141A Proposed Clear Vision Panel Configuration

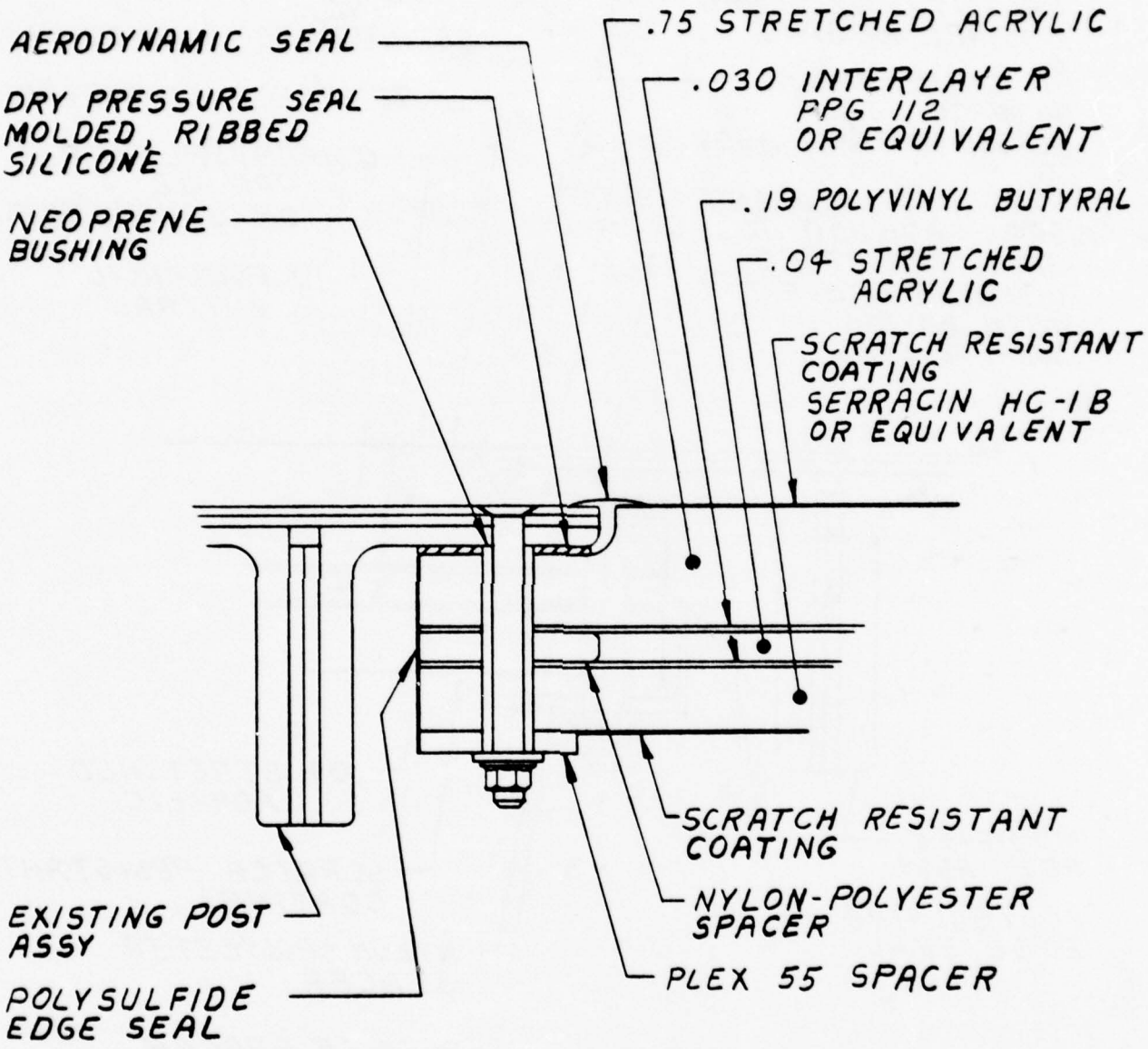


Figure 30. C-141A Proposed Side Panel Configuration

TABLE 17. DESIGN IMPROVEMENT TRADE STUDY 4 – C-141A WINDSHIELD REDESIGN

Present concept		Redesigned concept	
Item	10-yr life cycle cost	Item	10-yr life cycle cost
Field maintenance cost		Replacement cost	
Windshield	$ 4,830,844	Nonrecurring - tooling	$ 53,360
Glareshield	302,758	- engrg	52,315
		- certif & qual	272,876
Spares		Recurring - W/S retrofit	3,941,826
Windshield	7,691,817	- glareshield replmt	44,704
		Field maintenance cost	
		Windshield	2,318,805
		Glareshield	60,551
		Spares	
		Windshield	3,999,745
Total present concept cost	$12,825,419	Total redesign concept cost	$10,744,182
10-year LCC saving			$ 2,081,237
Annual LCC saving		$208,124	

TABLE 18. COST ANALYSIS

C-141A TRANSPARENCY SYSTEM

PRESENT CONCEPT

FIELD MAINTENANCE

Windshield and windows

WUC total (refer to page 120)	$ 340,440/yr
Total years	10
Escalation factor 1976-1983	1.419
Total 10-year LCC windshield and windows	$4,830,844

Instrument glare shield

WUC total labor per shield	6 hr/unit
Total glare shields	254 unit
Total annual hours	1,524 hours
Labor rate per K051 IROS	$ 14/hour
Total annual cost	$ 21,336
Escalation for 1976-1983	1.419
Total 10-year LCC instrument glare shield	$302,758

TOTAL PRESENT 10-YEAR LCC FIELD MAINTENANCE COST $ 5,133,602

SPARES

Windshields

WUC total (refer to page 120)	$ 542,059
Total years	10
Escalation for 1976-1983	1.419
Total windshields and window spares LSC	$7,691,817

TOTAL C-141A 10-YEAR LCC SPARES AND FIELD MAINTENANCE (PRESENT CONCEPT) $12,825,49

TABLE 18. COST ANALYSIS (Continued)

C-141A TRANSPARENCY SYSTEM

REDESIGNED CONCEPT

NONRECURRING COST		
Tooling		
(2) Strip		
PFP production flat pattern		10 hours
HDP hydropress die		150 hours
HTF heat treat fixture		60 hours
Molded silicone seal		
Mold		40 hours
SRD steel rule die		30 hours
Total tooling labor		290 hours
Tooling labor rate		$ 40/hour
Tooling labor dollars		$ 11,600
Tooling material at $6.00/hr (incl OH)		$ 1,740
Total tooling		$ 13,340
Total configurations		4
Total tooling for shipset		$53,360
Engineering		
Design		1,606 hours
TCTO		284 hours
Total engineering labor		1,290 hours
Engineering labor rate		$ 40/hour
Engineering labor		$ 51,600
Engineering material		$ 715
Total engineering		$52,315
Certification		
Engineering		$ 4,000
Testing		40,000
Panel fabrication (10 each)		24,219
1,523 + 340 + 588 new		
Current panel cost	$1,523	
Frame at 4 times boom sighting	340	
+ 30% new	558	
Total unit cost new	$2,421	
Total certification per panel		$ 68,219
Total certification	$68,219 x 4 config	$272,876
TOTAL NONRECURRING COST		$ 378,551

TABLE 18. COST ANALYSIS (Continued)

C-141A TRANSPARENCY SYSTEM

REDESIGNED CONCEPT - Continued

RECURRING COST

TOTAL ANNUAL FLIGHT HOURS	266,266 hours
TOTAL AIRCRAFT IN FLEET	254
AVERAGE ANNUAL FLIGHT HOURS PER AIRCRAFT	1,048 hr/yr
TOTAL SPARES REPLACEMENT (REPRESENTATIVE WINDSHIELD)	71 replacement
TOTAL AIRCRAFT IN FLEET	254
	3.58
MTBMA (1,048 x 3.58) CURRENT LIFE	3,752 hours
CURRENT AVERAGE FLIGHT HOURS/WINDSHIELD	10,000 hours
PPG 112 EQUIPPED DC-10 COMMERCIAL (2 at 13,000, 6 at 10,000, 3 at 8,000)	
PRIOR EXPERIENCE FOR COMMERCIAL/NON-PPG 112 EQUIPPED	3,500
REPLACEMENT FREQUENCY FACTOR	2.9
C-141A WINDOW CURRENT REPLACEMENT DURATION	2.7 yr
PROJECTED REPLACEMENT DURATION PPG 112 (2.9 x 3.6)	10.4 yr
REPLACEMENT FACTOR FOR C-141A TRANSPARENCY (10 ÷ 10.4)	0.96 per lifetime
FLEET REPLACEMENT COST PPG 112 MODIFIED TRANSPARENCIES ($2,217/UNIT x 7 UNITS/SHIP x 254 SHIPS) [$1,523 + (1,291 x CUM AVG FACTOR FOR 800 UNITS ON A 92% CRC = $2,217]	$3,941,826

FIELD MODIFICATION ESTIMATED

Modification effort/unit glare shield	12.6 hr
Labor rate per K051 IROS	$ 14/hour
Total labor	$ 176
Total units	254
TOTAL FIELD MODIFICATION COST OF GLARE SHIELD	$44,704
TOTAL RECURRING COST	$ 3,986,530

TABLE 18. COST ANALYSIS (Continued)

C-141A TRANSPARENCY SYSTEM

REDESIGNED CONCEPT - Continued

FIELD MAINTENANCE COST

WINDSHIELD	$ 340,440
Reduction for MTBF improvement DDCC	0.48
Total field maintenance for windshields per year	$ 163,411
Total time	10
Escalation	1.419
TOTAL WINDSHIELD FIELD MAINTENANCE COST	$2,318,805
INSTRUMENT GLARE SHIELD	
Current cost 10 years	$ 302,758
Reduction in cost for redesign	0.20
TOTAL INSTRUMENT GLARE SHIELD	$60,551
TOTAL RECURRING COST	$ 2,379,356
SPARES REQUIRED FOR NON-DDCC ACTIVITIES	
WINDSHIELD SPARES REQUIREMENTS ANNUALLY	$ 542,059
Non-DDCC spares factor	0.52
Total non-DDCC spares required annually	281,871
Escalation factor 1976-1983	1.419
Escalated annual cost of other spares	399,974
Total life cycle	10
TOTAL 10-YEAR LIFE CYCLE COST FOR WINDSHIELDS	$13,999,745
TOTAL 10-YEAR LCC SPARES COST	$ 3,999,745
TOTAL REDESIGNED CONCEPT COST	$10,744,182
TOTAL PRESENT CONCEPT COST	$12,825,419
TOTAL 10-YEAR LCC SAVING	$2,081,237
TOTAL ANNUAL LCC SAVING	$208,124

TABLE 18. COST ANALYSIS (Concluded)

C-141A TRANSPARENCY SYSTEM

CURRENT COST DETERMINATION

WUC	Hours	Dollars	Rate	Units	Cost/ Unit	Annual Cost
11AAA	3,911	63,786		70	1,088	76,160
11AAB	5,769	89,517		97	1,784	173,048
11AAC	3,951	63,051		63	1,436	90,468
11AAD	4,570	66,510		57	1,391	79,287
11AAU	4,020	57,576		69	1,784	123,096
Total	22,221	340,440	15.32	356		$542,059

Established rate $1,523/unit

Annual How Mal Code average percentage attributed to delamination, deterioration, chipping, and cracking (DDCC)

WUC HMC/Units	11AAA Transparencies	11AAB	11AAC	11AAD	11AAU	Total
846	12	10	17	14	6	59
190	29	74	8	10	55	176
117	1	5	-	4	1	11
910	-	-	1	10	-	11
Total HMC	42	89	26	38	62	257
Total WUC	107	147	96	86	103	539
%	39	61	27	44	60	48

DESIGN IMPROVEMENT TRADE STUDY 5 , T-38A CANOPY LOCKING MECHANISM REDESIGN

Problem

A high cost contributor of the T-38A canopy installation (figure 31) is due to the rigging tolerances associated with the locking mechanism and linkage. This problem is traced to the deterioration of potting compound in the splined connection of the operating cranks. The accumulation of backlash that can occur at 16 locations causes canopy locking problems. See figures 32 and 33.

The above problem was uncovered during the field audit of T-38A maintenance facilities. Examination of MAMS printout as shown in figure A-5 of Appendix A demonstrates the lack of adequate visibility for the identification of this very significant and costly maintenance problem. It points out the need for a means of altering or expanding the identification of the work unit code when a high frequency maintenance problem surfaces.

Proposed Revision

The proposed fix for this problem is to redesign the locking mechanism to provide a more positive attachment and to completely eliminate backlash.

Description of Change

Adjustment of the T-38A canopy locking mechanism is sensitive and critical. A feature that contributes to many hours of maintenance time is backlash that accumulates between the serrations of the downlock shafts and the operating cranks. There are 16 places in the T-38A aircraft where this backlash can occur. (Reference T.O. IT-38A-2-2, figures 31 and 34.)

The existing installation of the operating crank utilizes "Epon 815" adhesive to fill the space between the splines in the operating crank and the downlock shaft. Wear and tear, through normal usage of the canopy locking

mechanism, results in the accumulation of backlash, until it becomes necessary to disassemble the mechanism in order to replace the Epon 815 adhesive and/or the operating cranks and readjust the mechanism.

In order to provide a more positive attachment and to completely eliminate backlash, it is proposed to redesign the operating cranks to incorporate a mechanical clamp that is secured with a self-locking, threaded fastener. Rework, of the existing lock assemblies, is required to install an indexing pin in the downlock shaft, to ensure proper alignment when the operating crank is installed. The use of the Epon 815 adhesive, retaining pins, and safety wire is eliminated. (Reference T.O. IT-38A-2-2, figures 31 and 34.)

Cost Analysis

Tables 19 and 20 present a summary and a detailed breakdown of the costs involved in the modifying of the aircraft to incorporate this feature. The cost shown reflects labor rates as established from the MAM's failure analysis and cost of materiel, etc, as used in the Rockwell pricing process.

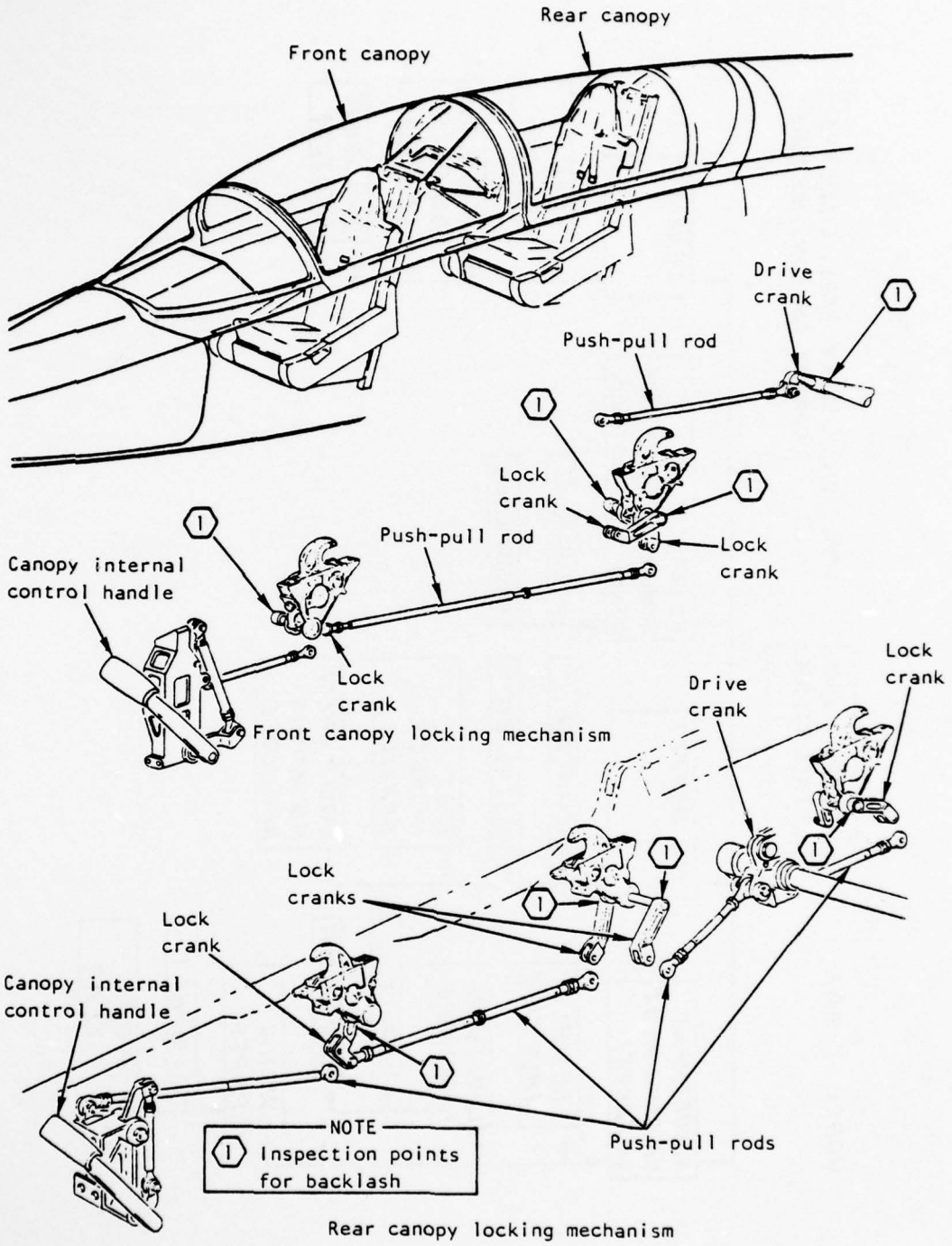


Figure 31. T-38A Windshield Canopy Locking Mechanisms

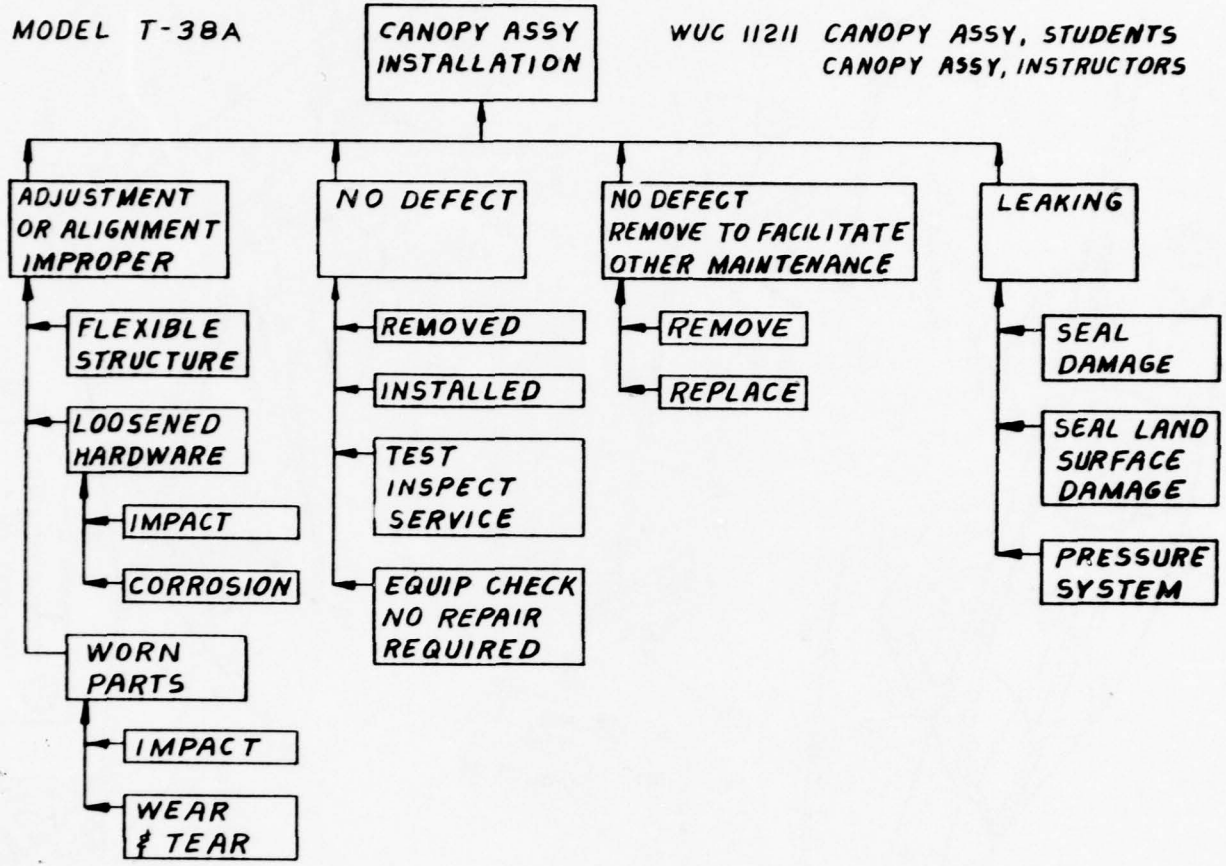
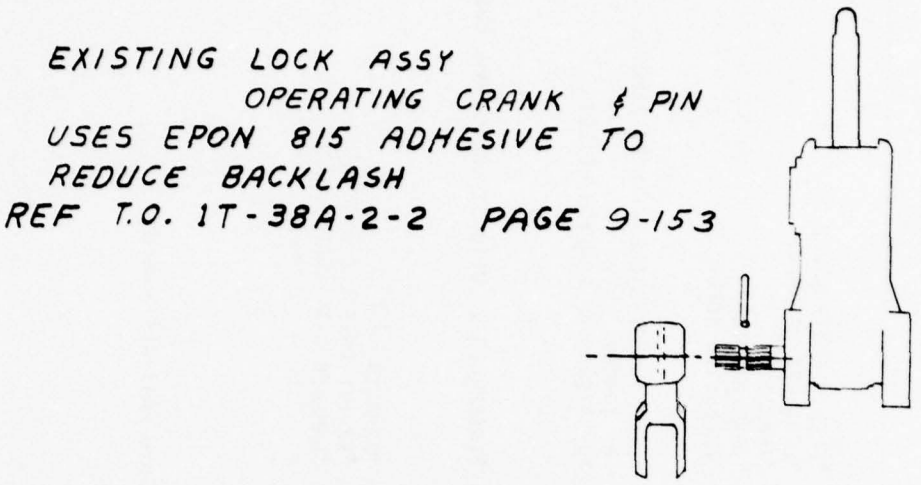


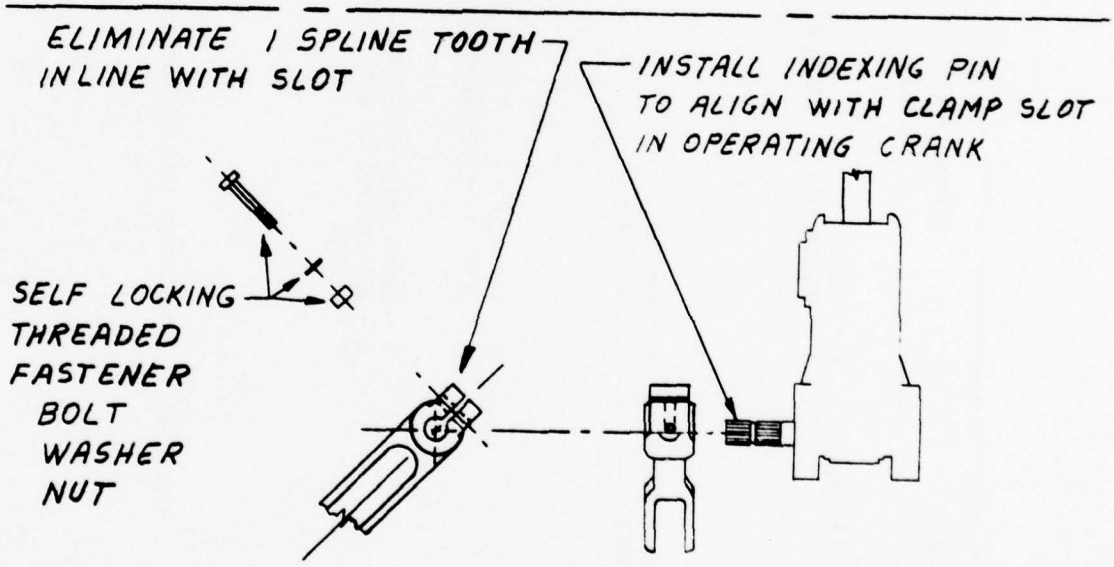
Figure 32. Fault Tree T-38A Canopy

HOW MAL	ACTION TAKEN	PROBABLE CAUSE
127 - ADJUSTMENT OR ALIGNMENT IMPROPER	L - ADJUST G - REPAIR/REPLACE MINOR PARTS F - REPAIR	•FLEXIBLE STRUCTURE •LOOSENED HARDWARE •IMPACT •WEAR AND TEAR •EXCESSIVE FORCE
800 - NO DEFECT - REMOVED FOR OTHER MAINTENANCE	P - REMOVED Q - INSTALL	•PART INACCESSIBLE WITHOUT REMOVAL OF CANOPY •RETRIEVAL OF FOREIGN OBJECTS
799 - NO DEFECT	Q - INSTALLED X - TEST, INSPECT, SERVICE	•INTERRELATED WITH OTHER HOW-MAL CODES
381 - LEAKING	A - BENCH CHECK AND REPAIR G - REPAIR/REPLACE MINOR PARTS F - REPAIR	•DAMAGED SEAL •FAULTY PRESSURE SYSTEM •DAMAGED SEAL LAND SURFACE

Figure 33. T-38A Canopy Locking Mechanism Failure Analysis Summary



EXISTING CONFIGURATION



- EXISTING LOCK ASSY (REWORKED)
- REDESIGNED OPERATING CRANK
- ELIMINATES BACKLASH

PROPOSED CONFIGURATION

Figure 34. Proposed Configuration T-38A Canopy Hook, Operating Crank

TABLE 19. DESIGN IMPROVEMENT TRADE STUDY 5 — T-38A CANOPY LOCKING MECHANISM REDESIGN

Present concept		Redesigned concept	
Item	10-yr life cycle cost	Item	10-yr life cycle cost
Field maintenance cost		Replacement cost	
Canopy lock-down mech	$1,908,715	Nonrecurring - tooling	$ 233,600
Enclosure maintenance	4,112,474	- engrg	34,880
		- test & qual	16,000
		Recurring - replmt	276,800
		- install	84,770
		Field maintenance cost	
		Enclosure maint	4,112,474
		Canopy lock-down mech	198,506
Total present concept cost	$6,021,189	Total redesigned concept cost	$4,957,030
10-year LCC saving			$1,064,159
Annual LCC saving		$106,416	

TABLE 20. COST ANALYSIS

T-38A CANOPY LOCKING MECHANISM

PRESENT CONCEPT

FIELD MAINTENANCE CANOPY LOCKDOWN MECHANISM

WUC total cost	$ 424,326
Percentage of effort for mechanism adjust/repair (refer to Current Cost Determination)	0.317
Total field maintenance for mechanism adjust/repair	134,511
Escalation factor 1976-1983	1.419
Total projected annual field maintenance	190,872
Projected lifetime of aircraft	10 years
PROJECTED 10-YEAR LSC FOR LOCKING MECHANISM FIELD MAINTENANCE	$1,908,715

OTHER FIELD MAINTENANCE

WUC total cost	$ 424,326
Less mechanism	134,511
Total other field maintenance	$ 289,815
Escalation factor for 1976-1983	1.419
Escalated annual other field maintenance	$ 411,247
Projected aircraft lifetime	10 years
PROJECTED FIELD MAINTENANCE COST 1978-1988	$4,112,474

TOTAL T-38A 10-YEAR LCC FIELD MAINTENANCE COST $6,021,189

TABLE 20. COST ANALYSIS (Continued)

T-38A CANOPY LOCKING MECHANISM

REDESIGNED CONCEPT

NONRECURRING			
Total development + 16 configuration x 14,600			$233,600
Fabrication 2 units at 18 ea = 36 hr x 40 = 1,400			
Tooling	300 hr x $40/hr	12,000	
Material		1,200	
Engineering	872 hours at $40/hr		$34,880
Testing	16 units at $1,000 ea		$16,000
TOTAL NONRECURRING		$	284,480
RECURRING REPLACEMENT			
16 x 865 units			13,840 units
Average unit cost			20
Total replacement cost			$276,800
Installation and adjustment at 7 hr/A/C x 865			6,055 hours
Field maintenance rate per K051 IROS		$	14/hour
Total installation			$84,770
TOTAL RECURRING REPLACEMENT COST		$	361,570
FIELD MAINTENANCE COST			
Enclosure maintenance			
Total cost of redesign		$	646,050
Field maintenance on redesign 10 years (refer to Redesign Field Maintenance)		$	198,506
Annual field maintenance other causes 10 years			$4,112,474
Canopy locking mech			
Current field maintenance locking mechanism			6,901 hours
Linkage adjustment other causes			-6,202 hours
Remaining field maintenance on linkage			699 hours
Percentage of effort for remaining mechanism			10.4%
Current field maintenance locking mechanism		$	134,511
Remaining field maintenance on redesigned lockdown maintenance			13,989
Escalation factor for 1976-1983			1.419
Escalated remaining field maintenance		$	19,850
Projected duration			10 years
Total locking mech maintenance			$198,506
TOTAL 10-YEAR LCC FIELD MAINTENANCE COST		$	4,310,980

TABLE 20. COST ANALYSIS (Continued)

T-38A CANOPY LOCKING MECHANISM

SUMMARY

TOTAL REDESIGNED CONCEPT COST	$4,957,030
TOTAL PRESENT CONCEPT COST	$6,021,189
TOTAL 10-YEAR LCC SAVING	$1,064,159
TOTAL ANNUAL LCC SAVING	$ 106,416

TABLE 20. COST ANALYSIS (Concluded)

T-38A CANOPY LOCKING MECHANISM

CURRENT COST DETERMINATION

	Field Maintenance Cost			Spares		
WUC	Hours	Dollars	Rate	Units	Unit Cost	Total Cost
11211	8,032.7	245,322				
11311	6,033.35	179,004				
Total WUC	14,066.05	424,326	30.17			

Adjustment-Oriented How Mal Codes

WUC	11211	11311	Total
HMC Units Remove/Replace			
127L	-	-	-
127G	16	5	21
127P	4	4	8
108	-	-	-
135	-	1	1
561	-	-	-
730	1	3	4
800F	1	1	2
931	-	-	-
932	-	-	-
Total	22	14	36
Total WUC	3,711	2,995	6,706
%	0.5	0.4	0.5
HMC Hours			
127L	3,558.91	2,643.99	6,202.9
127G	198.12	78.18	276.3
127P	30.67	18.67	49.34
108	0.17	-	0.17
135	14.59	13.42	28.01
561	7.75	-	7.75
730	7.75	94.94	102.69
800F	2.00	2.00	4.00
931	18.17	-	18.17
932	8.25	3.75	12.00
Total	3,846.38	2,854.95	6,701.33
Total WUC	12,048.4	9,049.58	21,097.98
%	31.9	31.5	31.7

MOST COST-EFFECTIVE PARAMETERS

On the basis of the design improvement trade studies contained in this section, it was determined that the most cost effective changes resulted from revised concepts aimed at correcting problems caused by environmental factors such as moisture penetration, solar heating, etc. This, however, was limited to exclude material and/or processes that require large developmental programs.

LEAST COST-EFFECTIVE PARAMETERS

Studies indicate that design improvements considering significant changes to the geometric characteristics such as panel size, fabrication concept, etc, are considered to be the least cost effective. Studies accomplished to date, however, indicate that design improvement is possible by the judicious choice of materials and selected type of construction arrangements that are currently available.

OTHER CANDIDATE STUDIES

The many studies directed at the identification of corrective programs for reduced logistical cost entailed the review of many transparency system maintenance problems. In view of the effort required to research, analyze, and assemble these data, the scope of the program permitted the development of only five design improvement studies. Since the five trades represent only a few of the viable improvements that may be considered, the following is a listing of potential improvement candidates that may be implemented at some future date.

1. Develop Quick-Cure Sealants and Aerosmoothing Compound

   The need to shorten the downtime of aircraft due to prolonged sealant curing time is considered to be of paramount importance to squadron commanders. It is desired to develop a sealant that will

significantly reduce curing time and maintain or increase the work time required for component replacement.

2. Design Panel Edge Framing for Improved Resistance to Moisture Penetration

One of the greatest problems that causes serious reduction of optical qualities in windshield assemblies is delaminations, principally attributed to moisture penetration of panel edges. The consideration of zee-type edge members to improve weather sealing is suggested. This type of construction is prevalent in commercial-type transport aircraft, and should be considered for use in applicable military aircraft.

3. Expand Development of Dry Seals

In recent years the application of dry seals to combat the moisture penetration problem has shown promising results in various aircraft. This concept has resulted in significant reduction in replacement man-hours. It is therefore recommended that greater use of this arrangement be explored.

4. Improve Frame-to-Transparent-Panel Attachment

Increased design studies aimed at improving frame-to-transparent-panel attachment to prevent local stress risers should be expanded. Despite technical order procedures in torquing of fasteners after replacement, cracks emanating from fastener holes frequently occur.

5. Uniform Fastener Attachment

Many of the windshields and enclosures reviewed during the field audit phase contain an extremely large variety of fasteners. This causes a significant expenditure in the assembly and handling of fasteners during the process of removal and replacement operation, and in the logistics of purchasing and stocking of these items. It

is recommended that trade studies be developed for the purpose of reducing the numbers and types of different fasteners required in a transparency assembly.

6. Design Frame for Improved Transparent Installation

The reinstallation of transparencies, especially fighter-type canopy enclosures, requires an extremely large number of man-hours, and specialized equipment. This is principally attributed to alignment and rigging problems. To reduce this problem it is suggested that relative stiffness of frame to glass be reviewed to avoid or minimize rigging, alignment, and tolerance problems. This relationship should be seriously considered in procurement of future transparency systems.

7. Improved Access to Windshield Fasteners

The access to windshield fasteners, especially the lower rows, is quite frequently very restricted. In some aircraft, it is sometimes necessary to cut wire bundles for access. To alleviate this problem, the incorporation of quick-disconnects is recommended.

8. Improve Sliding Window Mechanisms and Controls

Failure analysis of sliding window mechanisms indicates high frequency of adjustment and breakage of tracks, brackets, drives, latches, etc. Design improvements to prolong the life of these parts are needed.

9. Shock-Absorbing Devices for Sliding Windows

Examination of MDCS of AFM 66-1 for sliding windows indicates high rates of cracking and breakage of the panel assemblies. Field maintenance personnel attribute much of this problem to induced shock induced by window opening. It is therefore suggested that shock-absorbing devices be considered.

10. Improve Coatings for Windshields and Canopy Components

The problems associated with abrasions caused by environmental factors such as icing and sand blasting and especially those induced by ground handling cause excessive maintenance costs. It is recommended that research for improved coatings be expanded.

11. Improve Temperature Controller and Sensing Elements

Discussion with field personnel and evaluation of failure analysis indicate the need to improve the reliability of temperature controllers and sensing elements. The review of modern solid-state devices should be expanded.

12. Modify Flight Crew and Flight Line Personnel Uniform Scratch-Producing Items

A great deal of scratching of transparent components is caused by both flight and ground-handling personnel. During ingress or cleaning or maintenance action, sharp items of the uniforms worn, such as buttons, belt buckles, tags, helmets, etc, cause inadvertent scratching. It is therefore suggested that nonabrasive coatings or materials be considered to reduce the damage to transparencies.

13. Incorporate the Work Unit Code Number in the -4 Illustrated Parts Catalog

As an aid in the identification of parts it is suggested that -4 illustrated parts catalogs developed for future procurement contain a cross reference of the work unit code.

14. Expand Level of WUC Description

Examination of the -06 Work Unit Code Manual indicates a lack of adequate assignment of WUC numbers and descriptors. Although it is recognized that there must be a practical limit of identification and

description, there is need for some extension. It is therefore recommended that an increased level of identification and descriptors for high maintenance and high cost contributors be appended to -06 manual, in the form of amendments.

15. Expand Indoctrination of WUC Selection to Maintenance Personnel

Due to the wide variety of WUC necessary to adequately define the maintenance activity, a great deal of judgment is needed in the selection of the proper assignment of work unit codes and the associated selection How-Mal codes. To enable maintenance personnel to obtain a better understanding of the importance of proper selection of WUC, it is suggested that specialized training or indoctrination courses be included as part of the training process.

16. Improve Content of Technical Manuals

Discussions with field personnel indicates the transparency maintenance instructions as contained in the respective aircraft technical manuals are generally overspecified and are too extensive, or contain descriptive matter that is inadequately defined. It is therefore suggested that instructional text be reviewed for improved clarity and consistency of procedures.

SECTION V

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The data and the analysis assembled in this study conclusively indicate that significant savings are possible in the logistical costs of maintaining transparency systems for aircraft in current inventory. Although these findings have been recognized in previous years, the potential benefits of improved design concepts have not been fully recognized in terms of life cycle costs. Other benefits that have been identified in addition to reduced logistical cost are:

1. Increased lifespan for maintaining design to optical qualities

2. Increased reliability of transparency components and interactive support systems

3. Increased safety of flight

4. Development of design improvements and concepts that can be incorporated in the next generation aircraft

RECOMMENDATIONS

Having identified the problems and associated costs for the transparency systems for the 20 selected study aircraft, it is recommended that a design improvement program be implemented. The program envisioned would proceed with a preliminary design (layout to adequate level of detailing) for the five design improvements identified in section IV. This effort should validate to the detail level the concepts selected, review the system and aircraft interface, and validate costs. If the results of this program verify the conceptual

study recommendations, proceed with detail design, fabrication, and retrofit program.

During the course of this program, Rockwell has reviewed data collected from both the Air Force and industry, and has established a logical and systematic approach to identify, assess, and analyze transparency system maintenance problems. It is therefore recommended that the Air Force periodically implement additional programs to update the established data base and continue the search for design improvement studies.

APPENDIX A

SAMPLE MAINTENANCE ANALYSIS MODEL (MAMS) PRINTOUTS

FIGURE A-1. T-39A DESIGN/COST MAMS
FIGURE A-2. KC-135A DESIGN/COST MAMS
FIGURE A-3. B-52G/H DESIGN/COST MAMS
FIGURE A-4. C-141A DESIGN/COST MAMS
FIGURE A-5. T-38A DESIGN COST/MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 1

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

41535 W/S HEAT CONTROLER-A $56,568 LSC/YEAR | 21.73 PCT OF LSC | 1 LSC RANK | 2,593.19 MANHOURS | 15.0736 MANHRS /1000 FLT HR | 10.91 PCT OF MH | 4 MANHOUR RANK

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	824.78	31.8	U RPLCD AFTER CANBLZTN	293.12	35.5	F BETWEEN FLT GND CREW	708.76	85.9
			T REMOVE FOR CANIBLZTN	244.55	29.7	D INFLIGHT NO ABORT	76.62	9.3
			Q INSTALLED	188.31	22.8	K HOURLY POSTFLIGHT	12.50	1.5
			X TEST-INSPECT-SERVICE	63.14	7.7	H POST/THRUFLT	8.00	1.0
			R REMOVE AND REPLACE	20.17	2.4	C INFLIGHT ABORT	6.80	0.8
			H EQUIP CK NO RPR RQRD	10.09	1.2	S INTERIOR REFURBISHMT	5.10	0.6
			P REMOVED	5.00	0.6	M PERIODIC/PHASED INSP	4.00	0.5
			B BNCH CK-NO RPR RQRD	0.42	0.1	R QC CHECK	2.00	0.2
						A BEFORE FLT ABORT	1.00	0.1
374 INTERNAL FAILURE	793.68	30.6	R REMOVE AND REPLACE	519.66	65.5	F BETWEEN FLT GND CREW	405.21	51.1
			1 BNCH CK-NRTS-NOT ATH	184.40	23.2	D INFLIGHT NO ABORT	332.66	41.9
			F REPAIR	33.00	4.2	Y RECEIPT FROM STOCK	33.00	4.2
			P REMOVED	22.89	2.9	A BEFORE FLT ABORT	10.50	1.3
			Y TROUBLESHOOT	10.92	1.4	S INTERIOR REFURBISHMT	10.00	1.3
			C BNCH CK-RPR DEFERRED	10.00	1.3	B BEFORE FLT NO ABORT	1.30	0.2
			G RPR/RPLT MINOR PARTS	7.00	0.9	H POST/THRUFLT	1.00	0.1
			Q INSTALLED	4.50	0.6			
			B BNCH CK-RTN TO DEPOT	1.30	0.2			
242 FAILED TO OPERATE	319.76	12.3	R REMOVE AND REPLACE	221.62	69.3	D INFLIGHT NO ABORT	150.97	47.2
			1 BNCH CK-NRTS-NOT ATH	39.00	12.2	F BETWEEN FLT GND CREW	147.83	46.2
			Y TROUBLESHOOT	33.30	10.4	C INFLIGHT ABORT	9.20	2.9
			P REMOVED	25.84	8.1	M PERIODIC/PHASED INSP	6.00	1.9
						P FUNCTIONAL CK FLT	2.60	0.8
						A BEFORE FLT ABORT	2.17	0.7
						H POST/THRUFLT	1.00	0.3
169 INCORRECT VOLTAGE	104.06	4.0	A BNCH CK AND REPAIRED	57.00	54.8	F BETWEEN FLT GND CREW	58.89	56.6
			R REMOVE AND REPLACE	34.00	32.7	D INFLIGHT NO ABORT	32.17	30.9
			1 BNCH CK-NRTS-NOT ATH	8.22	7.9	C INFLIGHT ABORT	13.00	12.5
			P REMOVED	4.50	4.3			
			Y TROUBLESHOOT	0.33	0.3			
615 SHORTED	100.84	3.9	1 BNCH CK-NRTS-NOT ATH	38.84	38.5	F BETWEEN FLT GND CREW	49.54	49.1
			R REMOVE AND REPLACE	28.00	27.8	D INFLIGHT NO ABORT	48.30	47.9
			F REPAIR	12.00	11.9	M PERIODIC/PHASED INSP	3.00	3.0
			C BNCH CK-RPR DEFERRED	6.00	6.0			
			P REMOVED	5.00	5.0			
			G RPR/RPLT MINOR PARTS	4.50	4.5			
			Y TROUBLESHOOT	3.50	3.5			
			Q INSTALLED	3.00	3.0			
304 TEMPERATURE INCORR	69.60	2.7	F REPAIR	33.00	47.4	Y RECEIPT FROM STOCK	33.00	47.4
			X TEST-INSPECT-SERVICE	15.80	22.7	J PREFLIGHT	15.80	22.7
			Y TROUBLESHOOT	10.80	15.5	F BETWEEN FLT GND CREW	12.00	17.2
			R REMOVE AND REPLACE	8.00	11.5	D INFLIGHT NO ABORT	8.80	12.6
			1 BNCH CK-NRTS-NOT ATH	2.00	2.9			

Figure A-1. T-39A Design/Cost MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 2

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

41535 W/S HEAT CONTROLER-A (CONT.) $56,568 LSC/YEAR 21.73 PCT OF LSC 1 LSC RANK 2,593.19 MANHOURS 15.0736 MANHRS /1000 FLT HR 10.91 PCT OF MH 4 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF WMC
901	INTERMITTENT	48.30	1.9	R	REMOVE AND REPLACE	31.00	65.8	F	BETWEEN FLT GND CREW	26.34	54.5
				1	BNCH CK-NRTS-NOT ATH	9.00	18.6	D	INFLIGHT NO ABORT	21.97	45.5
				Y	TROUBLESHOOT	4.00	8.3				
				G	RPR/RPLT MINOR PARTS	3.50	7.2				
450	OPEN	47.66	1.8	R	REMOVE AND REPLACE	35.71	74.9	D	INFLIGHT NO ABORT	18.00	37.8
				1	BNCH CK-NRTS-NOT ATH	7.95	16.7	F	BETWEEN FLT GND CREW	16.65	34.9
				C	BNCH CK-RPR DEFERRED	2.00	4.2	B	BEFORE FLT NO ABORT	13.00	27.3
				P	REMOVED	1.00	2.1				
				2	BNCH CK-NRTS-LCK EQP	1.00	2.1				
127	ADJMT/ALGNMT IMPROPR	45.47	1.8	L	ADJUST	19.80	43.5	F	BETWEEN FLT GND CREW	23.80	52.3
				A	BNCH CK AND REPAIRED	15.17	33.4	D	INFLIGHT NO ABORT	21.67	47.7
				R	REMOVE AND REPLACE	8.00	17.6				
				1	BNCH CK-NRTS-NOT ATH	2.50	5.5				
160	CONTACTS/CONN DEFECT	44.74	1.7	R	REMOVE AND REPLACE	10.00	22.4	F	BETWEEN FLT GND CREW	41.74	93.3
				F	REPAIR	8.00	17.9	D	INFLIGHT NO ABORT	3.00	6.7
				1	BNCH CK-NRTS-NOT ATH	8.00	17.9				
				G	RPR/RPLT MINOR PARTS	5.90	13.2				
				Y	TROUBLESHOOT	5.83	13.0				
				C	BNCH CK-RPR DEFERRED	4.00	8.9				
				Q	INSTALLED	3.00	6.7				
037	FLUCTUATES-UNSTABLE	41.80	1.6	R	REMOVE AND REPLACE	29.00	69.4	D	INFLIGHT NO ABORT	27.00	64.6
				Y	TROUBLESHOOT	8.00	19.1	C	INFLIGHT ABORT	11.80	28.2
				1	BNCH CK-NRTS-NOT ATH	4.80	11.5	B	BEFORE FLT NO ABORT	3.00	7.2
255	NO/INCORRECT OUTPUT	40.92	1.6	F	REPAIR	16.50	40.3	Y	RECEIPT FROM STOCK	16.50	40.3
				R	REMOVE AND REPLACE	6.92	16.9	D	INFLIGHT NO ABORT	11.42	27.9
				P	REMOVED	5.50	13.4	F	BETWEEN FLT GND CREW	9.00	22.0
				C	BNCH CK-RPR DEFERRED	5.00	12.2	B	BEFORE FLT NO ABORT	4.00	9.8
				1	BNCH CK-NRTS-NOT ATH	4.00	9.8				
				A	BNCH CK AND REPAIRED	3.00	7.3				
800	NO DEF-RMVD-OTH MAINT	27.23	1.1	P	REMOVED	14.30	52.5	F	BETWEEN FLT GND CREW	19.83	72.8
				Q	INSTALLED	6.20	22.8	D	INFLIGHT NO ABORT	7.40	27.2
				S	REMOVE AND REINSTALL	4.40	16.2				
				R	REMOVE AND REPLACE	2.33	8.6				
106	MISSING BOLTS,NUTS..	17.34	0.7	G	RPR/RPLT MINOR PARTS	17.34	100.0	F	BETWEEN FLT GND CREW	7.33	42.3
								3	HOME STA CK-ISOCHRNL	6.50	37.5
								M	PERIODIC/PHASED INSP	2.00	11.5
								K	HOURLY POSTFLIGHT	1.50	8.7
750	MISSING	12.80	0.5	G	RPR/RPLT MINOR PARTS	10.30	80.5	F	BETWEEN FLT GND CREW	8.00	62.5
				1	BNCH CK-NRTS-NOT ATH	2.50	19.5	D	INFLIGHT NO ABORT	2.50	19.5
								K	HOURLY POSTFLIGHT	2.30	18.0

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 3

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

41535 W/S HEAT CONTROLER-A (CONT.) $56,568 LSC/YEAR 21.73 PCT OF LSC 1 LSC RANK 2,595.19 MANHOURS 15.0736 MANHRS /1000 FLT HR 10.91 PCT OF MH 4 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MAC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
070	BROKEN	12.60	0.5	R	REMOVE AND REPLACE	12.60	100.0	D	INFLIGHT NO ABORT	10.60	84.1
								F	BETWEEN FLT GND CREW	2.00	15.9
748	FREQ ERRATIC-INCORR	8.00	0.3	1	BNCH CK-NRTS-NOT ATH	8.00	100.0	F	BETWEEN FLT GND CREW	8.00	100.0
900	BURNED OR OVERHEATED	8.00	0.3	G	RPR/RPLT MINOR PARTS	8.00	100.0	F	BETWEEN FLT GND CREW	8.00	100.0
730	LOOSE	6.00	0.2	G	RPR/RPLT MINOR PARTS	6.00	100.0	B	BEFORE FLT NO ABORT	4.00	66.7
								D	INFLIGHT NO ABORT	2.00	33.3
103	ATTACK DISP MALFUNC	5.00	0.2	G	RPR/RPLT MINOR PARTS	5.00	100.0	F	BETWEEN FLT GND CREW	5.00	100.0
028	CURRENT INCORRECT	4.00	0.2	R	REMOVE AND REPLACE	4.00	100.0	D	INFLIGHT NO ABORT	4.00	100.0
105	LOOSE/DMGD BOLTS,NUT	3.25	0.1	G	RPR/RPLT MINOR PARTS	3.25	100.0	D	INFLIGHT NO ABORT	2.25	69.2
								K	HOURLY POSTFLIGHT	1.00	30.8
812	NO DEF-ASSOC EQP MAL	3.00	0.1	P	REMOVED	3.00	100.0	F	BETWEEN FLT GND CREW	3.00	100.0
080	DEFECTIVE LAMP/METER	1.50	0.1	1	BNCH CK-NRTS-NOT ATH	1.50	100.0	D	INFLIGHT NO ABORT	1.50	100.0
721	IMPROP RESP-ELEC IPT	1.25	0.0	1	BNCH CK-NRTS-NOT ATH	1.25	100.0	F	BETWEEN FLT GND CREW	1.25	100.0
025	CAPACITANCE INCORR	0.83	0.0	R	REMOVE AND REPLACE	0.83	100.0	D	INFLIGHT NO ABORT	0.83	100.0
719	BRK/FRYED BND/GND WR	0.80	0.0	G	RPR/RPLT MINOR PARTS	0.80	100.0	K	HOURLY POSTFLIGHT	0.80	100.0

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 4

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11120 PILOTS SLIDING WINDO $33,321 LSC/YEAR 12.80 PCT OF LSC 2 LSC RANK 2,756.90 MANHOURS 16.0252 MANHRS /1000 FLT HR 11.60 PCT OF MH 3 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
127	ADJMT/ALGNMT IMPROPR	796.66	28.9	L	ADJUST	718.44	90.2	F	BETWEEN FLT GND CREW	313.68	39.4
				G	RPR/RPLT MINOR PARTS	41.50	5.2	D	INFLIGHT NO ABORT	189.35	23.8
				A	BNCH CK AND REPAIRED	20.42	2.6	K	HOURLY POSTFLIGHT	87.52	11.0
				R	REMOVE AND REPLACE	10.30	1.3	M	PERIODIC/PHASED INSP	57.26	7.2
				Y	TROUBLESHOOT	6.00	0.8	H	POST/THRUFLT	52.00	6.5
								J	PREFLIGHT	51.84	6.5
								B	BEFORE FLT NO ABORT	16.00	2.0
								5	INTERIOR REFURBISHMT	12.00	1.5
								E	AFTER FLIGHT	10.00	1.3
								R	QC CHECK	4.00	0.5
								3	HOME STA CK-ISOCHRNL	3.00	0.4
799	NO DEFECT	397.01	14.4	Q	INSTALLED	246.99	62.2	F	BETWEEN FLT GND CREW	247.74	62.4
				T	REMOVE FOR CANIBLZTN	47.25	11.9	H	POST/THRUFLT	47.51	12.0
				H	EQUIP CK NO RPR RQRD	41.47	10.4	M	PERIODIC/PHASED INSP	39.80	10.0
				U	RPLCD AFTER CANBLZTN	36.80	9.3	D	INFLIGHT NO ABORT	24.97	6.3
				P	REMOVED	11.00	2.8	B	BEFORE FLT NO ABORT	15.00	3.8
				X	TEST-INSPECT-SERVICE	10.00	2.5	5	INTERIOR REFURBISHMT	8.00	2.0
				G	RPR/RPLT MINOR PARTS	3.50	0.9	K	HOURLY POSTFLIGHT	6.00	1.5
								J	PREFLIGHT	4.00	1.
								3	HOME STA CK-ISOCHRNL	4.00	1.0
381	LEAKING INT OR EXT	311.84	11.3	G	RPR/RPLT MINOR PARTS	216.21	69.3	F	BETWEEN FLT GND CREW	133.28	42.7
				L	ADJUST	70.83	22.7	D	INFLIGHT NO ABORT	122.06	39.1
				F	REPAIR	12.80	4.1	H	POST/THRUFLT	16.00	5.1
				P	REMOVED	10.00	3.2	C	INFLIGHT ABORT	12.00	3.8
				Y	TROUBLESHOOT	2.00	0.6	B	BEFORE FLT NO ABORT	9.00	2.9
								3	HOME STA CK-ISOCHRNL	6.00	1.9
								M	PERIODIC/PHASED INSP	5.50	1.8
								K	HOURLY POSTFLIGHT	5.00	1.6
								5	INTERIOR REFURBISHMT	3.00	1.0
848	DELAMINATED	286.34	10.4	R	REMOVE AND REPLACE	109.81	38.4	F	BETWEEN FLT GND CREW	184.21	64.4
				P	REMOVED	75.11	26.3	D	INFLIGHT NO ABORT	73.31	25.6
				A	BNCH CK AND REPAIRED	52.34	18.3	M	PERIODIC/PHASED INSP	16.10	5.6
				G	RPR/RPLT MINOR PARTS	19.10	6.7	H	POST/THRUFLT	11.00	3.8
				Y	TROUBLESHOOT	17.92	6.3	J	PREFLIGHT	0.92	0.3
				X	TEST-INSPECT-SERVICE	8.75	3.1	3	HOME STA CK-ISOCHRNL	0.50	0.2
				C	BNCH CK-RPR DEFERRED	1.00	0.3				
				9	BNCH CK-CONDENNED	1.00	0.3				
				2	BNCH CK-NRTS-LCK EQP	0.50	0.2				
				B	BNCH CK-RTN TO DEPOT	0.50	0.2				
800	NO DEF-RMVD-OTH MAINT	218.92	7.9	Q	INSTALLED	137.49	62.8	5	INTERIOR REFURBISHMT	103.76	47.4
				P	REMOVED	59.24	27.1	F	BETWEEN FLT GND CREW	42.54	19.4
				S	REMOVE AND REINSTALL	14.20	6.5	K	HOURLY POSTFLIGHT	34.75	15.9
				G	RPR/RPLT MINOR PARTS	6.80	3.1	M	PERIODIC/PHASED INSP	23.00	10.5
				X	TEST-INSPECT-SERVICE	1.25	0.6	H	POST/THRUFLT	13.87	6.3

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 5

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11120 PILOTS SLIDING WINDO (CONT.) $33,321 LSC/YEAR 12.80 PCT OF LSC 2 LSC RANK 2,756.90 MANHOURS 16.0252 MANHRS /1000 FLT HR 11.60 PCT OF MH 3 MANHOUR RANK

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						J PREFLIGHT	1.00	0.5
910 CHIPPED	87.15	3.2	R REMOVE AND REPLACE	62.81	72.1	F BETWEEN FLT GND CREW	79.65	91.4
			G RPR/RPLT MINOR PARTS	15.34	17.6	D INFLIGHT NO ABORT	7.50	8.6
			P REMOVED	7.00	8.0			
			2 BNCH CK-NRTS-LCK EQP	1.50	1.7			
			C BNCH CK-RPR DEFERRED	0.50	0.6			
105 LOOSE/DMGD BOLTS,NUT	80.77	2.9	G RPR/RPLT MINOR PARTS	73.86	91.4	F BETWEEN FLT GND CREW	55.47	68.7
			A BNCH CK AND REPAIRED	5.00	6.2	K HOURLY POSTFLIGHT	10.80	13.4
			L ADJUST	1.00	1.2	R QC CHECK	6.25	7.7
			R REMOVE AND REPLACE	0.92	1.1	M PERIODIC/PHASED INSP	2.67	3.3
						H POST/THRUFLT	2.25	2.8
						D INFLIGHT NO ABORT	2.00	2.5
						5 INTERIOR REFURBISHMT	1.00	1.2
						3 HOME STA CK-ISOCHRNL	0.33	0.4
242 FAILED TO OPERATE	80.55	2.9	Q INSTALLED	44.01	54.6	D INFLIGHT NO ABORT	55.01	68.3
			R REMOVE AND REPLACE	33.54	41.6	F BETWEEN FLT GND CREW	25.53	31.7
			Y TROUBLESHOOT	3.00	3.7			
190 CRACKED	64.49	2.3	R REMOVE AND REPLACE	33.30	51.6	F BETWEEN FLT GND CREW	22.79	35.3
			A BNCH CK AND REPAIRED	15.84	24.6	M PERIODIC/PHASED INSP	19.00	29.5
			G RPR/RPLT MINOR PARTS	8.40	13.0	D INFLIGHT NO ABORT	14.00	21.7
			P REMOVED	4.20	6.5	K HOURLY POSTFLIGHT	7.60	11.8
			F REPAIR	1.75	2.7	3 HOME STA CK-ISOCHRNL	0.80	1.2
			1 BNCH CK-NRTS-NOT ATH	1.00	1.6	P FUNCTIONAL CK FLT	0.30	0.5
135 BINDING,STUCK,JAMMED	50.44	1.8	G RPR/RPLT MINOR PARTS	30.93	61.3	F BETWEEN FLT GND CREW	41.10	81.5
			L ADJUST	19.50	38.7	D INFLIGHT NO ABORT	4.00	7.9
						E AFTER FLIGHT	3.00	5.9
						3 HOME STA CK-ISOCHRNL	1.33	2.6
						K HOURLY POSTFLIGHT	1.00	2.0
020 WORN CHAFED OR FRAYD	45.01	1.6	G RPR/RPLT MINOR PARTS	30.51	67.8	K HOURLY POSTFLIGHT	16.00	35.5
			A BNCH CK AND REPAIRED	11.50	25.5	F BETWEEN FLT GND CREW	11.50	25.5
			R REMOVE AND REPLACE	3.00	6.7	5 INTERIOR REFURBISHMT	11.50	25.5
						M PERIODIC/PHASED INSP	6.00	13.3
106 MISSING BOLTS,NUTS.	44.02	1.6	G RPR/RPLT MINOR PARTS	44.02	100.0	F BETWEEN FLT GND CREW	23.17	52.6
						M PERIODIC/PHASED INSP	15.80	35.9
						D INFLIGHT NO ABORT	2.80	6.4
						K HOURLY POSTFLIGHT	2.00	4.5
						3 HOME STA CK-ISOCHRNL	0.25	0.6
374 INTERNAL FAILURE	39.75	1.4	R REMOVE AND REPLACE	28.00	70.4	H POST/THRUFLT	28.00	70.4
			P REMOVED	11.75	29.6	D INFLIGHT NO ABORT	11.75	29.6
070 BROKEN	35.30	1.3	A BNCH CK AND REPAIRED	16.00	45.3	F BETWEEN FLT GND CREW	26.50	75.1

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 6

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11120 PILOTS SLIDING WINDO (CONT.) $33,321 LSC/YEAR 12.80 PCT OF LSC 2 LSC RANK 2,756.90 MANHOURS 16.0252 MANHRS /1000 FLT HR 11.60 PCT OF MH 3 MANHOUR RANK

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WMC
			G RPR/RPLT MINOR PARTS	14.30	40.5	M PERIODIC/PHASED INSP	4.00	11.3
			P REMOVED	5.00	14.2	4 CORROSION CONTR INSP	3.80	10.8
						R QC CHECK	1.00	2.8
605 CRAZED	31.01	1.1	R REMOVE AND REPLACE	19.00	61.3	M PERIODIC/PHASED INSP	31.01	100.0
			A BNCH CK AND REPAIRED	9.00	29.0			
			P REMOVED	3.00	9.7			
865 PROT COAT/SEALNT DEF	27.00	1.0	G RPR/RPLT MINOR PARTS	15.00	55.6	F BETWEEN FLT GND CREW	15.00	55.6
			R REMOVE AND REPLACE	12.00	44.4	D INFLIGHT NO ABORT	12.00	44.4
932 DOES NOT ENGAGE/LOCK	24.75	0.9	Q INSTALLED	9.00	36.4	D INFLIGHT NO ABORT	17.25	69.7
			P REMOVED	8.25	33.3	C INFLIGHT ABORT	4.50	18.2
			L ADJUST	7.50	30.3	H POST/THRUFLT	3.00	12.1
117 DETERIORATED	23.20	0.8	G RPR/RPLT MINOR PARTS	23.20	100.0	F BETWEEN FLT GND CREW	11.20	48.3
						M PERIODIC/PHASED INSP	8.00	34.5
						B BEFORE FLT NO ABORT	3.00	12.9
						D INFLIGHT NO ABORT	1.00	4.3
230 DIRTY CONTAM SATURAT	20.09	0.7	V CLEAN	20.09	100.0	F BETWEEN FLT GND CREW	14.59	72.6
						K HOURLY POSTFLIGHT	5.00	24.9
						3 HOME STA CK-ISOCHRNL	0.50	2.5
805 NO DEF-NOC-OTH MAINT	17.50	0.6	G RPR/RPLT MINOR PARTS	15.50	88.6	F BETWEEN FLT GND CREW	15.50	88.6
			P REMOVED	1.00	5.7	M PERIODIC/PHASED INSP	1.00	5.7
			R REMOVE AND REPLACE	1.00	5.7	5 INTERIOR REFURBISHMT	1.00	5.7
730 LOOSE	15.08	0.5	G RPR/RPLT MINOR PARTS	10.25	68.0	F BETWEEN FLT GND CREW	8.00	53.1
			L ADJUST	3.83	25.4	M PERIODIC/PHASED INSP	4.50	29.8
			P REMOVED	1.00	6.6	D INFLIGHT NO ABORT	1.33	8.8
						R QC CHECK	1.25	8.3
567 RESISTANCE INCORRECT	13.50	0.5	R REMOVE AND REPLACE	13.50	100.0	F BETWEEN FLT GND CREW	13.50	100.0
884 LEAD BROKEN	10.00	0.4	G RPR/RPLT MINOR PARTS	10.00	100.0	F BETWEEN FLT GND CREW	10.00	100.0
116 CUT	6.50	0.2	G RPR/RPLT MINOR PARTS	6.00	92.3	F BETWEEN FLT GND CREW	6.50	100.0
			2 BNCH CK-NRTS-LCK EQP	0.50	7.7			
750 MISSING	6.50	0.2	G RPR/RPLT MINOR PARTS	5.50	84.6	F BETWEEN FLT GND CREW	4.00	61.5
			Q INSTALLED	1.00	15.4	M PERIODIC/PHASED INSP	1.50	23.1
						K HOURLY POSTFLIGHT	1.00	15.4
334 TEMPERATURE INCORR	6.00	0.2	F REPAIR	6.00	100.0	D INFLIGHT NO ABORT	6.00	100.0
518 IMPROPER ROUTING	4.70	0.2	G RPR/RPLT MINOR PARTS	4.70	100.0	D INFLIGHT NO ABORT	2.70	57.4
						M PERIODIC/PHASED INSP	2.00	42.6

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 7

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11120 PILOTS SLIDING WINDO (CONT.) $33,321 LSC/YEAR 12.80 PCT OF LSC 2 LSC RANK 2,756.90 MANHOURS 16.0252 MANHRS /1000 FLT HR 11.60 PCT OF MH 3 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
160	CONTACTS/CONN DEFECT	3.50	0.1	G	RPR/RPLT MINOR PARTS	3.50	100.0	F	BETWEEN FLT GND CREW	3.50	100.0
947	TORN	3.00	0.1	G	RPR/RPLT MINOR PARTS	3.00	100.0	3	HOME STA CK-ISOCHRNL	2.00	66.7
								M	PERIODIC/PHASED INSP	1.00	33.3
350	INSULATION BREAKDOWN	2.80	0.1	G	RPR/RPLT MINOR PARTS	2.80	100.0	F	BETWEEN FLT GND CREW	2.80	100.0
170	CORRODED-MILD/MODRTE	1.75	0.1	Z	CORROSION REPAIR	1.75	100.0	M	PERIODIC/PHASED INSP	1.25	71.4
								W	IN-SHOP REPAIR	0.50	28.6
780	BENT,BUCKLED,COLLASP	1.00	0.0	G	RPR/RPLT MINOR PARTS	1.00	100.0	F	BETWEEN FLT GND CREW	1.00	100.0
615	SHORTED	0.80	0.0	1	BNCH CK-NRTS-NOT ATH	0.80	100.0	D	INFLIGHT NO ABORT	0.80	100.0
622	WET/CONDENSATION	0.25	0.0	P	REMOVED	0.25	100.0	R	QC CHECK	0.25	100.0

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 8

FLIGHT HOURS= 172,036 NO. OF FLIGHTS= 207,203 TOTAL MANHOURS= 23,775.31 TOTAL LSC/YEAR= $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS= 138.19

11111 W/S PANEL GLASS $33,060 LSC/YEAR 12.70 PCT OF LSC 3 LSC RANK 4,276.26 MANHOURS 24.8568 MANHRS /1000 FLT HR 17.99 PCT OF MH 1 MANHOUR RANK

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
799 NO DEFECT	1461.50	34.2	Q INSTALLED	1406.94	96.3	F BETWEEN FLT GND CREW	986.30	67.5
			P REMOVED	24.50	1.7	D INFLIGHT NO ABORT	278.02	19.0
			H EQUIP CK NO RPR RQRD	11.50	0.8	H POST/THRUFLT	79.68	5.5
			X TEST-INSPECT-SERVICE	9.30	0.6	P FUNCTIONAL CK FLT	74.50	5.1
			G RPR/RPLT MINOR PARTS	8.25	0.6	C INFLIGHT ABORT	15.00	1.0
			T REMOVE FOR CANIBLZTN	1.00	0.1	E AFTER FLIGHT	15.00	1.0
						M PERIODIC/PHASED INSP	10.00	0.7
						Q SPECIAL INSPECTION	3.00	0.2
848 DELAMINATED	1218.47	28.5	P REMOVED	594.31	48.8	F BETWEEN FLT GND CREW	669.86	55.0
			R REMOVE AND REPLACE	432.91	35.5	D INFLIGHT NO ABORT	254.87	20.9
			Q INSTALLED	179.00	14.7	H POST/THRUFLT	234.24	19.2
			G RPR/RPLT MINOR PARTS	10.25	0.8	K HOURLY POSTFLIGHT	45.00	3.7
			X TEST-INSPECT-SERVICE	2.00	0.2	M PERIODIC/PHASED INSP	14.50	1.2
190 CRACKED	805.54	18.8	P REMOVED	471.23	58.5	F BETWEEN FLT GND CREW	327.18	40.6
			Q INSTALLED	190.37	23.6	D INFLIGHT NO ABORT	120.40	14.9
			R REMOVE AND REPLACE	121.43	15.1	C INFLIGHT ABORT	114.18	14.2
			A BNCH CK AND REPAIRED	16.00	2.0	J PREFLIGHT	73.26	9.1
			Y TROUBLESHOOT	5.50	0.7	A BEFORE FLT ABORT	58.50	7.3
			G RPR/RPLT MINOR PARTS	1.00	0.1	P FUNCTIONAL CK FLT	45.00	5.6
						M PERIODIC/PHASED INSP	43.75	5.4
						H POST/THRUFLT	22.25	2.8
						K HOURLY POSTFLIGHT	1.00	0.1
780 BENT,BUCKLED,COLLASP	126.20	3.0	R REMOVE AND REPLACE	92.20	73.1	F BETWEEN FLT GND CREW	98.20	77.8
			P REMOVED	26.00	20.6	D INFLIGHT NO ABORT	28.00	22.2
			G RPR/RPLT MINOR PARTS	6.00	4.8			
			X TEST-INSPECT-SERVICE	2.00	1.6			
381 LEAKING INT OR EXT	104.56	2.4	G RPR/RPLT MINOR PARTS	98.56	94.3	F BETWEEN FLT GND CREW	95.50	91.3
			P REMOVED	3.00	2.9	H POST/THRUFLT	3.80	3.6
			R REMOVE AND REPLACE	3.00	2.9	D INFLIGHT NO ABORT	3.00	2.9
						M PERIODIC/PHASED INSP	2.25	2.2
800 NO DEF-RMVD-OTH MAINT	94.50	2.2	Q INSTALLED	56.50	59.8	F BETWEEN FLT GND CREW	71.50	75.7
			P REMOVED	23.00	24.3	H POST/THRUFLT	12.50	13.2
			S REMOVE AND REINSTALL	15.00	15.9	D INFLIGHT NO ABORT	10.50	11.1
105 LOOSE/DMGD BOLTS,NUT	75.06	1.8	G RPR/RPLT MINOR PARTS	71.06	94.7	F BETWEEN FLT GND CREW	46.56	62.0
			F REPAIR	4.00	5.3	D INFLIGHT NO ABORT	16.50	22.0
						M PERIODIC/PHASED INSP	6.00	8.0
						G GROUND ALERT-NOT DGR	4.00	5.3
						H POST/THRUFLT	1.00	1.3
						K HOURLY POSTFLIGHT	1.00	1.3
070 BROKEN	71.01	1.7	P REMOVED	63.01	88.7	F BETWEEN FLT GND CREW	71.01	100.0
			A BNCH CK AND REPAIRED	8.00	11.3			

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 9

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11111 W/S PANEL GLASS (CONT.) $33,060 LSC/YEAR 12.70 PCT OF LSC 3 LSC RANK 4,276.26 MANHOURS 24.8568 MANHRS /1000 FLT HR 17.99 PCT OF MH 1 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF HMC
709	ADMIN CONDEMNATION	49.01	1.1	R	REMOVE AND REPLACE	49.01	100.0	D	INFLIGHT NO ABORT	49.01	100.0
935	SCORED OR SCRAICHED	46.84	1.1	R	REMOVE AND REPLACE	31.17	66.5	D	INFLIGHT NO ABORT	26.51	56.6
				G	RPR/RPLT MINOR PARTS	15.67	33.5	F	BETWEEN FLT GND CREW	20.34	43.4
900	BURNED OR OVERHEATED	39.60	0.9	P	REMOVED	39.60	100.0	H	POST/THRUFLT	39.60	100.0
605	CRAZED	38.34	0.9	R	REMOVE AND REPLACE	38.34	100.0	F	BETWEEN FLT GND CREW	38.34	100.0
242	FAILED TO OPERATE	30.00	0.7	P	REMOVED	30.00	100.0	D	INFLIGHT NO ABORT	30.00	100.0
230	DIRTY CONTAM SATURAT	29.75	0.7	Y	CLEAN	29.75	100.0	F	BETWEEN FLT GND CREW	24.00	80.7
								A	QC CHECK	5.75	19.3
007	ARCING, ARCED	24.00	0.6	P	REMOVED	24.00	100.0	D	INFLIGHT NO ABORT	24.00	100.0
805	NO DEF-NOC-OTH MAINT	23.00	0.5	G	RPR/RPLT MINOR PARTS	23.00	100.0	F	BETWEEN FLT GND CREW	23.00	100.0
106	MISSING BOLTS,NUTS..	8.80	0.2	G	RPR/RPLT MINOR PARTS	8.80	100.0	F	BETWEEN FLT GND CREW	5.80	65.9
								D	INFLIGHT NO ABORT	3.00	34.1
169	INCORRECT VOLTAGE	5.30	0.1	G	RPR/RPLT MINOR PARTS	5.30	100.0	D	INFLIGHT NO ABORT	5.30	100.0
020	WORN CHAFED OR FRAYD	4.80	0.1	R	REMOVE AND REPLACE	4.80	100.0	F	BETWEEN FLT GND CREW	4.80	100.0
246	IMPROP/FAULTY MAINT	4.00	0.1	P	REMOVED	4.00	100.0	F	BETWEEN FLT GND CREW	4.00	100.0
567	RESISTANCE INCORRECT	4.00	0.1	Y	TROUBLESHOOT	4.00	100.0	D	INFLIGHT NO ABORT	4.00	100.0
884	LEAD BROKEN	4.00	0.1	G	RPR/RPLT MINOR PARTS	4.00	100.0	F	BETWEEN FLT GND CREW	4.00	100.0
127	ADJMT/ALGNMT IMPROPR	3.50	0.1	G	RPR/RPLT MINOR PARTS	3.00	85.7	C	INFLIGHT ABORT	3.00	85.7
				L	ADJUST	0.50	14.3	M	PERIODIC/PHASED INSP	0.50	14.3
116	CUT	2.00	0.0	R	REMOVE AND REPLACE	2.00	100.0	K	HOURLY POSTFLIGHT	2.00	100.0
947	TORN	1.50	0.0	R	REMOVE AND REPLACE	1.50	100.0	M	PERIODIC/PHASED INSP	1.50	100.0
117	DETERIORATED	1.00	0.0	G	RPR/RPLT MINOR PARTS	1.00	100.0	3	HOME STA CK-ISOCHRNL	1.00	100.0

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 10

FLIGHT= 172,036 NO. OF= 207,203 TOTAL= 23,775.31 TOTAL= $260,269 TOTAL MANHOURS= 138.19

HOURS FLIGHTS MANHOURS LSC/YEAR /1000 FLIGHT HOURS

11110 WINDSHIELD $27,441 LSC/YEAR 10.54 PCT OF LSC 4 LSC RANK 2,910.45 MANHOURS 16.9642 MANHRS /1000 FLT HR 12.28 PCT OF MH 2 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
799	NO DEFECT	1201.35	41.2	Q	INSTALLED	1123.04	93.5	F	BETWEEN FLT GND CREW	801.56	66.7
				R	REMOVE AND REPLACE	32.01	2.7	D	INFLIGHT NO ABORT	185.77	15.5
				X	TEST-INSPECT-SERVICE	21.50	1.8	H	POST/THRUFLT	148.92	12.4
				H	EQUIP CK NO RPR RQRD	18.80	1.6	C	INFLIGHT ABORT	27.17	2.3
				F	REPAIR	6.00	0.5	S	INTERIOR REFURBISHMT	24.00	2.0
								E	AFTER FLIGHT	7.92	0.7
								M	PERIODIC/PHASED INSP	4.00	0.3
								J	PREFLIGHT	2.00	0.2
846	DELAMINATED	444.99	15.2	P	REMOVED	281.46	63.3	F	BETWEEN FLT GND CREW	315.06	70.8
				R	REMOVE AND REPLACE	72.34	16.3	H	POST/THRUFLT	56.51	12.7
				Q	INSTALLED	55.93	12.6	B	BEFORE FLT NO ABORT	33.00	7.4
				V	CLEAN	15.50	3.5	D	INFLIGHT NO ABORT	26.00	5.8
				G	RPR/RPLT MINOR PARTS	12.75	2.9	E	AFTER FLIGHT	7.92	1.8
				Y	TROUBLESHOOT	7.00	1.6	M	PERIODIC/PHASED INSP	6.50	1.5
190	CRACKED	437.60	15.0	P	REMOVED	207.70	47.5	D	INFLIGHT NO ABORT	158.78	36.3
				Q	INSTALLED	153.19	35.0	F	BETWEEN FLT GND CREW	119.90	27.4
				R	REMOVE AND REPLACE	53.31	12.2	C	INFLIGHT ABORT	82.43	18.8
				G	RPR/RPLT MINOR PARTS	15.40	3.5	H	POST/THRUFLT	29.34	6.7
				Y	TROUBLESHOOT	8.00	1.8	J	PREFLIGHT	24.75	5.7
								M	PERIODIC/PHASED INSP	15.40	3.5
								B	BEFORE FLT NO ABORT	7.00	1.6
117	DETERIORATED	182.76	6.3	R	REMOVE AND REPLACE	122.25	66.9	F	BETWEEN FLT GND CREW	177.76	97.3
				P	REMOVED	56.00	30.6	H	POST/THRUFLT	2.50	1.4
				Y	TROUBLESHOOT	4.00	2.2	K	HOURLY POSTFLIGHT	2.50	1.4
				G	RPR/RPLT MINOR PARTS	0.50	0.3				
381	LEAKING INT OR EXT	165.02	5.7	G	RPR/RPLT MINOR PARTS	115.51	70.0	F	BETWEEN FLT GND CREW	141.01	85.5
				P	REMOVED	25.50	15.5	Y	RECEIPT FROM STOCK	24.00	14.5
				F	REPAIR	24.00	14.5				
900	BURNED OR OVERHEATED	145.80	5.0	P	REMOVED	102.80	70.5	F	BETWEEN FLT GND CREW	78.80	54.0
				R	REMOVE AND REPLACE	43.00	29.5	D	INFLIGHT NO ABORT	43.00	29.5
								S	INTERIOR REFURBISHMT	24.00	16.5
800	NO DEF-RMVD-OTH MAINT	88.21	3.0	Q	INSTALLED	73.01	82.8	J	PREFLIGHT	40.01	45.4
				L	ADJUST	12.00	13.6	F	BETWEEN FLT GND CREW	36.20	41.0
				P	REMOVED	2.20	2.5	D	INFLIGHT NO ABORT	12.00	13.6
				G	RPR/RPLT MINOR PARTS	1.00	1.1				
805	NO DEF-NOC-OTH MAINT	47.51	1.6	S	REMOVE AND REINSTALL	32.51	68.4	D	INFLIGHT NO ABORT	32.51	68.4
				G	RPR/RPLT MINOR PARTS	13.00	27.4	F	BETWEEN FLT GND CREW	15.00	31.6
				P	REMOVED	2.00	4.2				
105	LOOSE/DMGD BOLTS,NUT	39.72	1.4	G	RPR/RPLT MINOR PARTS	35.72	89.9	F	BETWEEN FLT GND CREW	24.42	61.5
				L	ADJUST	4.00	10.1	M	PERIODIC/PHASED INSP	10.25	25.8

Figure A-1. T-39A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-39 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 FEB. 13, 1978 PAGE 11

FLIGHT HOURS = 172,036 NO. OF FLIGHTS = 207,203 TOTAL MANHOURS = 23,775.31 TOTAL LSC/YEAR = $260,269 TOTAL MANHOURS /1000 FLIGHT HOURS = 138.19

11110 WINDSHIELD (CONT.) $27,441 LSC/YEAR 10.54 PCT OF LSC 4 LSC RANK 2,918.45 MANHOURS 16.9642 MANHRS /1000 FLT HR 12.28 PCT OF MH 2 MANHOUR RANK

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF WMC
								K	HOURLY POSTFLIGHT	4.80	12.1
								R	QC CHECK	0.25	0.6
230	DIRTY CONTAM SATURAT	39.67	1.4	V	CLEAN	39.67	100.0	H	POST/1HRUFLT	18.00	45.4
								F	BETWEEN FLT GND CREW	16.00	40.3
								M	PERIODIC/PHASED INSP	2.67	6.7
								R	QC CHECK	2.00	5.0
								K	HOURLY POSTFLIGHT	1.00	2.5
587	RESISTANCE INCORRECT	32.01	1.1	P	REMOVED	32.01	100.0	J	PREFLIGHT	32.01	100.0
070	BROKEN	30.80	1.1	P	REMOVED	30.80	100.0	D	INFLIGHT NO ABORT	20.00	64.9
								F	BETWEEN FLT GND CREW	10.80	35.1
605	CRAZED	26.50	0.9	P	REMOVED	26.50	100.0	F	BETWEEN FLT GND CREW	26.50	100.0
242	FAILED TO OPERATE	10.00	0.3	Y	TROUBLESHOOT	10.00	100.0	D	INFLIGHT NO ABORT	8.00	80.0
								F	BETWEEN FLT GND CREW	2.00	20.0
865	PROT COAT/SEALNT DEF	6.00	0.2	G	RPR/RPLT MINOR PARTS	6.00	100.0	H	POST/1HRUFLT	6.00	100.0
106	MISSING BOLTS,NUTS..	5.05	0.2	G	RPR/RPLT MINOR PARTS	5.05	100.0	J	PREFLIGHT	4.00	79.2
								K	HOURLY POSTFLIGHT	1.05	20.8
947	TORN	3.97	0.1	G	RPR/RPLT MINOR PARTS	2.97	74.8	F	BETWEEN FLT GND CREW	1.67	42.1
				R	REMOVE AND REPLACE	1.00	25.2	D	INFLIGHT NO ABORT	1.30	32.7
								K	HOURLY POSTFLIGHT	1.00	25.2
730	LOOSE	3.20	0.1	G	RPR/RPLT MINOR PARTS	3.20	100.0	F	BETWEEN FLT GND CREW	2.50	78.1
								M	PERIODIC/PHASED INSP	0.70	21.9
374	INTERNAL FAILURE	3.00	0.1	R	REMOVE AND REPLACE	3.00	100.0	F	BETWEEN FLT GND CREW	3.00	100.0
660	STRIPPED	2.50	0.1	G	RPR/RPLT MINOR PARTS	2.50	100.0	F	BETWEEN FLT GND CREW	2.50	100.0
020	WORN CHAFED OR FRAYD	1.30	0.0	R	REMOVE AND REPLACE	1.30	100.0	D	INFLIGHT NO ABORT	1.30	100.0
450	OPEN	1.00	0.0	P	REMOVED	1.00	100.0	M	PERIODIC/PHASED INSP	1.00	100.0
804	NO DEF-SCH MAINT/MOD	0.50	0.0	X	TEST-INSPECT-SERVICE	0.50	100.0	U	NON-DESTRUCTIVE INSP	0.50	100.0

Figure A-1. T-39A Design/Cost MAMS (Concluded)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 1

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114H PILOT/COPILOT #1 $179.226 LSC/YEAR | PCT OF LSC 21.08 TOTAL | LSC RNK 1 | 28624.79 MAN HRS | PCT OF MHR 23.47 TOTAL | MHR RNK 1 | 100.8163 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	11947.55	41.7	H EQUIP CK NO RPR RQRD	7581.62	63.5	H POST/THRUFLT	7262.10	60.8
			X TEST-INSPECT-SERVICE	2827.60	23.7	M PERIODIC/PHASED INSP	2908.65	24.3
			Q INSTALLED	1437.39	12.0	F BETWEEN FLT GND CREW	1282.20	10.7
			T REMOVE FOR CANIBLZTN	30.17	0.3	D INFLIGHT NO ABORT	289.17	2.4
			U RPLCD AFTER CANBLZTN	27.01	0.2	4 CORROSION CONTR INSP	62.51	0.5
			G RPR/RPLT MINOR PARTS	26.64	0.2	A BEFORE FLT ABORT	58.01	0.5
			R REMOVE AND REPLACE	12.00	0.1	J PREFLIGHT	37.51	0.3
			J CLBRTD-NO ADJMT RQRD	2.83	0.0	B BEFORE FLT NO ABORT	21.50	0.2
			L ADJUST	1.30	0.0	E AFTER FLIGHT	12.00	0.1
			F REPAIR	1.00	0.0	X ENGINE TEST STAND OP	6.50	0.1
						K HOURLY POSTFLIGHT	4.40	0.0
						R QC CHECK	2.00	0.0
						Q SPECIAL INSPECTION	1.00	0.0
105 LOOSE/DMGD BOLTS,NUT	4461.17	15.6	G RPR/RPLT MINOR PARTS	4103.77	92.0	H POST/THRUFLT	2110.12	47.3
			L ADJUST	280.16	6.3	M PERIODIC/PHASED INSP	1793.65	40.2
			X TEST-INSPECT-SERVICE	50.34	1.1	F BETWEEN FLT GND CREW	315.64	7.1
			R REMOVE AND REPLACE	12.30	0.3	D INFLIGHT NO ABORT	111.75	2.5
			F REPAIR	11.30	0.3	R QC CHECK	64.34	1.4
			Y TROUBLESHOOT	2.00	0.0	N GROUND ALERT-DEGRAD	50.68	1.1
			Q INSTALLED	1.30	0.0	4 CORROSION CONTR INSP	9.00	0.2
						J PREFLIGHT	5.00	0.1
						B BEFORE FLT NO ABORT	0.50	0.0
						K HOURLY POSTFLIGHT	0.30	0.0
						C INFLIGHT ABORT	0.20	0.0
846 DELAMINATED	2857.08	10.0	R REMOVE AND REPLACE	2075.27	72.6	M PERIODIC/PHASED INSP	813.99	28.5
			P REMOVED	415.21	14.5	H POST/THRUFLT	725.83	25
			X TEST-INSPECT-SERVICE	265.82	9.3	F BETWEEN FLT GND CREW	622.69	21.8
			G RPR/RPLT MINOR PARTS	40.20	1.4	S DEPOT LEVEL MAINTNCE	328.00	11.5
			Y TROUBLESHOOT	37.67	1.3	D INFLIGHT NO ABORT	186.53	6.5
			Q INSTALLED	16.00	0.6	J PREFLIGHT	148.03	5.2
			F REPAIR	4.00	0.1	B BEFORE FLT NO ABORT	16.00	0.6
			L ADJUST	1.00	0.0	Q SPECIAL INSPECTION	16.00	0.6
			9 BNCH CK-CONDENNED	1.00	0.0			
			1 BNCH CK-NRTS-NOT ATH	0.90	0.0			
190 CRACKED	2313.49	8.1	R REMOVE AND REPLACE	1694.08	73.2	H POST/THRUFLT	920.46	39.8
			P REMOVED	409.11	17.7	D INFLIGHT NO ABORT	460.75	19.9
			Q INSTALLED	103.02	4.5	M PERIODIC/PHASED INSP	391.55	16.9
			G RPR/RPLT MINOR PARTS	66.01	2.9	F BETWEEN FLT GND CREW	371.70	16.1
			X TEST-INSPECT-SERVICE	32.80	1.4	E AFTER FLIGHT	58.01	2.5
			A BNCH CK AND REPAIRED	3.50	0.2	R QC CHECK	37.00	1.6
			B BNCH CK-RTN TO DEPOT	2.00	0.1	A BEFORE FLT ABORT	36.00	1.6
			Y TROUBLESHOOT	1.67	0.1	J PREFLIGHT	27.50	1.2
			L ADJUST	1.30	0.1	4 CORROSION CONTR INSP	10.50	0.5

Figure A-2. KC-135A Design/Cost MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 2

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.60	429.63

1114H PILOT/COPILOT #1 (CONT.) $179.226 LSC/YEAR | PCT OF LSC 21.08 TOTAL | LSC RNK 1 | 28624.79 MAN HRS | PCT OF MHR 23.47 TOTAL | MHR RNK 1 | 100.8163 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
117 DETERIORATED	1253.10	4.4	G RPR/RPLT MINOR PARTS	787.14	62.8	M PERIODIC/PHASED INSP	922.55	73.6
			R REMOVE AND REPLACE	377.65	30.1	F BETWEEN FLT GND CREW	167.03	13.3
			P REMOVED	32.30	2.6	H POST/THRUFLT	114.37	9.1
			X TEST-INSPECT-SERVICE	29.20	2.3	D INFLIGHT NO ABORT	28.34	2.3
			F REPAIR	15.80	1.3	R QC CHECK	15.80	1.3
			Q INSTALLED	11.00	0.9	A BEFORE FLT ABORT	5.00	0.4
910 CHIPPED	1047.02	3.7	R REMOVE AND REPLACE	920.04	87.9	H POST/THRUFLT	438.80	41.9
			P REMOVED	103.01	9.8	F BETWEEN FLT GND CREW	254.71	24.3
			Y TROUBLESHOOT	14.00	1.3	M PERIODIC/PHASED INSP	250.16	23.9
			G RPR/RPLT MINOR PARTS	4.00	0.4	D INFLIGHT NO ABORT	86.68	8.3
			B BNCH CK-CONDENNED	3.00	0.3	R QC CHECK	16.00	1.5
			X TEST-INSPECT-SERVICE	2.97	0.3	C INFLIGHT ABORT	0.67	0.1
935 SCORED OR SCRATCHED	700.35	2.4	R REMOVE AND REPLACE	455.74	65.1	H POST/THRUFLT	425.26	60.7
			P REMOVED	170.98	24.4	F BETWEEN FLT GND CREW	123.58	17.6
			X TEST-INSPECT-SERVICE	72.83	10.4	M PERIODIC/PHASED INSP	115.51	16.5
			Y TROUBLESHOOT	0.80	0.1	D INFLIGHT NO ABORT	20.00	2.9
						4 CORROSION CONTR INSP	16.00	2.3
900 BURNED OR OVERHEATED	475.67	1.7	R REMOVE AND REPLACE	306.34	64.4	H POST/THRUFLT	135.32	28.4
			P REMOVED	98.22	20.6	M PERIODIC/PHASED INSP	112.82	23.7
			Q INSTALLED	64.01	13.5	F BETWEEN FLT GND CREW	87.01	18.3
			G RPR/RPLT MINOR PARTS	6.00	1.3	C INFLIGHT ABORT	64.01	13.5
			X TEST-INSPECT-SERVICE	0.80	0.2	A BEFORE FLT ABORT	44.51	9.4
			Y TROUBLESHOOT	0.30	0.1	D INFLIGHT NO ABORT	32.01	6.7
108 MISSING BOLTS,NUTS..	404.07	1.4	G RPR/RPLT MINOR PARTS	364.23	90.1	M PERIODIC/PHASED INSP	193.48	47.9
			F REPAIR	16.00	4.0	H POST/THRUFLT	124.74	30.9
			Q INSTALLED	15.50	3.8	F BETWEEN FLT GND CREW	33.34	8.3
			L ADJUST	2.83	0.7	R QC CHECK	20.30	5.0
			X TEST-INSPECT-SERVICE	2.30	0.6	D INFLIGHT NO ABORT	16.00	4.0
			R REMOVE AND REPLACE	2.00	0.5	G GROUND ALERT-NOT DGR	16.00	4.0
			Y TROUBLESHOOT	0.90	0.2	B BEFORE FLT NO ABORT	0.20	0.0
			V CLEAN	0.30	0.1			
730 LOOSE	371.23	1.3	L ADJUST	220.92	59.5	H POST/THRUFLT	197.78	53.3
			G RPR/RPLT MINOR PARTS	141.21	38.0	M PERIODIC/PHASED INSP	163.41	44.0
			X TEST-INSPECT-SERVICE	6.80	1.8	F BETWEEN FLT GND CREW	7.83	2
			R REMOVE AND REPLACE	2.30	0.6	R QC CHECK	1.70	0.5
						D INFLIGHT NO ABORT	0.50	0.1
805 NO DEF-NOC-OTH MAINT	319.24	1.1	G RPR/RPLT MINOR PARTS	185.29	58.0	F BETWEEN FLT GND CREW	182.93	57.3
			Q INSTALLED	102.65	32.2	D INFLIGHT NO ABORT	55.01	17.2
			S REMOVE AND REINSTALL	26.30	8.2	M PERIODIC/PHASED INSP	42.30	13.3
			P REMOVED	3.00	0.9	H POST/THRUFLT	31.34	9.8
			X TEST-INSPECT-SERVICE	2.00	0.6	N GROUNT ALERT-DEGRAD	7.67	2.4

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 3

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114H PILOT/COPILOT #1 (CONT.) $179,226 LSC/YEAR | PCT OF LSC 21.08 TOTAL | LSC RNK 1 | 28624.79 MAN HRS | PCT OF MHR 23.47 TOTAL | MHR RNK 1 | 100.8163 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
800 NO DEF-RMVD-OTH MAINT	316.32	1.1	Q INSTALLED	176.84	55.9	M PERIODIC/PHASED INSP	155.50	49.2
			P REMOVED	85.34	27.0	F BETWEEN FLT GND CREW	81.97	25.9
			G RPR/RPLT MINOR PARTS	37.30	11.8	H POST/THRUFLT	47.51	15.0
			S REMOVE AND REINSTALL	13.83	4.4	D INFLIGHT NO ABORT	31.34	9.9
			R REMOVE AND REPLACE	2.50	0.8			
			X TEST-INSPECT-SERVICE	0.50	0.2			
865 PROT COAT/SEALNT DEF	243.13	0.8	G RPR/RPLT MINOR PARTS	209.13	86.0	M PERIODIC/PHASED INSP	151.99	62.5
			R REMOVE AND REPLACE	18.00	7.4	D INFLIGHT NO ABORT	40.01	16.5
			F REPAIR	16.00	6.6	H POST/THRUFLT	25.67	10.6
						F BETWEEN FLT GND CREW	21.97	9.0
						4 CORROSION CONTR INSP	2.00	0.8
						R QC CHECK	1.50	0.6
007 ARCING, ARCED	190.58	0.7	R REMOVE AND REPLACE	174.48	91.6	H POST/THRUFLT	109.97	57.7
			P REMOVED	6.00	3.1	M PERIODIC/PHASED INSP	67.51	35.4
			X TEST-INSPECT-SERVICE	4.00	2.1	B BEFORE FLT NO ABORT	4.00	2.1
			G RPR/RPLT MINOR PARTS	3.10	1.6	J PREFLIGHT	4.00	2.1
			Y TROUBLESHOOT	3.00	1.6	A BEFORE FLT ABORT	3.00	1.6
						F BETWEEN FLT GND CREW	2.00	1.0
						R QC CHECK	0.10	0.1
750 MISSING	177.49	0.6	G RPR/RPLT MINOR PARTS	147.88	83.3	M PERIODIC/PHASED INSP	95.58	53.9
			Q INSTALLED	17.90	10.1	H POST/THRUFLT	49.31	27.8
			Y TROUBLESHOOT	3.50	2.0	F BETWEEN FLT GND CREW	18.60	10.5
			F REPAIR	3.00	1.7	D INFLIGHT NO ABORT	6.00	3.4
			L ADJUST	3.00	1.7	R QC CHECK	6.00	3.4
			X TEST-INSPECT-SERVICE	2.20	1.2	B BEFORE FLT NO ABORT	2.00	1.1
605 CRAZED	141.01	0.5	R REMOVE AND REPLACE	104.00	73.8	S DEPOT LEVEL MAINTNCE	88.00	62.4
			P REMOVED	37.00	26.2	H POST/THRUFLT	29.00	20.6
						M PERIODIC/PHASED INSP	24.00	17.0
246 IMPROP/FAULTY MAINT	139.87	0.5	G RPR/RPLT MINOR PARTS	91.07	65.1	R QC CHECK	54.67	39.1
			R REMOVE AND REPLACE	25.10	17.9	H POST/THRUFLT	40.20	28.7
			L ADJUST	21.00	15.0	M PERIODIC/PHASED INSP	23.00	16.4
			F REPAIR	2.00	1.4	S DEPOT LEVEL MAINTNCE	12.00	8.6
			X TEST-INSPECT-SERVICE	0.50	0.4	F BETWEEN FLT GND CREW	4.00	2.9
			Y TROUBLESHOOT	0.20	0.1	J PREFLIGHT	4.00	2.9
						D INFLIGHT NO ABORT	2.00	1.4
381 LEAKING INT OR EXT	139.86	0.5	G RPR/RPLT MINOR PARTS	72.18	51.6	D INFLIGHT NO ABORT	121.85	87.1
			R REMOVE AND REPLACE	57.01	40.8	H POST/THRUFLT	12.00	8.6
			Y TROUBLESHOOT	10.67	7.6	F BETWEEN FLT GND CREW	6.00	4.3
127 ADJMT/ALGNMT IMPROPR	121.24	0.4	L ADJUST	100.04	82.5	M PERIODIC/PHASED INSP	44.00	36.3
			G RPR/RPLT MINOR PARTS	11.20	9.2	H POST/THRUFLT	42.24	34.8
			A BNCH CK AND REPAIRED	8.00	6.6	F BETWEEN FLT GND CREW	14.00	11.5

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 4

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114H PILOT/COPILOT #1 (CONT.) $179,226 LSC/YEAR | PCT OF LSC 21.08 TOTAL | LSC RNK 1 | 28624.79 MAN HRS | PCT OF MHR 23.47 TOTAL | MHR RNK 1 | 100.8163 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			X TEST-INSPECT-SERVICE	2.00	1.6	D INFLIGHT NO ABORT	10.00	8.2
						J PREFLIGHT	5.00	4.1
						R QC CHECK	4.00	3.3
						A BEFORE FLT ABORT	2.00	1.6
242 FAILED TO OPERATE	118.19	0.4	Y TROUBLESHOOT	61.18	51.6	D INFLIGHT NO ABORT	55.21	46.7
			R REMOVE AND REPLACE	52.01	44.0	F BETWEEN FLT GND CREW	39.97	33.8
			G RPR/RPLT MINOR PARTS	5.00	4.2	B BEFORE FLT NO ABORT	10.00	8.5
						A BEFORE FLT ABORT	8.00	6.8
						M PERIODIC/PHASED INSP	5.00	4.2
020 WORN CHAFED OR FRAYD	117.94	0.4	G RPR/RPLT MINOR PARTS	106.61	90.4	F BETWEEN FLT GND CREW	49.27	41.8
			R REMOVE AND REPLACE	9.33	7.9	M PERIODIC/PHASED INSP	43.97	37.3
			L ADJUST	2.00	1.7	H POST/THRUFLT	18.30	15.5
						4 CORROSION CONTR INSP	4.00	3.4
						G GROUND ALERT-NOT DGR	2.40	2.0
374 INTERNAL FAILURE	109.81	0.4	R REMOVE AND REPLACE	99.51	90.6	M PERIODIC/PHASED INSP	49.01	44.6
			Y TROUBLESHOOT	10.00	9.1	F BETWEEN FLT GND CREW	35.80	32.6
			G RPR/RPLT MINOR PARTS	0.30	0.3	H POST/THRUFLT	21.00	19.1
						D INFLIGHT NO ABORT	4.00	3.6
070 BROKEN	102.11	0.4	R REMOVE AND REPLACE	43.81	42.9	F BETWEEN FLT GND CREW	52.81	51.7
			G RPR/RPLT MINOR PARTS	41.30	40.4	M PERIODIC/PHASED INSP	18.00	17.6
			F REPAIR	16.00	15.7	H POST/THRUFLT	17.80	17.4
			C BNCH CK-RPR DEFERRED	1.00	1.0	D INFLIGHT NO ABORT	8.00	7.8
						G GROUND ALERT-NOT DGR	4.00	3.9
						S DEPOT LEVEL MAINTNCE	1.50	1.5
615 SHORTED	82.51	0.3	R REMOVE AND REPLACE	52.01	63.0	D INFLIGHT NO ABORT	55.01	66.7
			G RPR/RPLT MINOR PARTS	21.50	26.1	F BETWEEN FLT GND CREW	11.50	13.9
			P REMOVED	9.00	10.9	H POST/THRUFLT	11.00	13.3
						A BEFORE FLT ABORT	5.00	6.1
177 FUEL FLOW INCORRECT	42.01	0.1	R REMOVE AND REPLACE	40.01	95.2	H POST/THRUFLT	40.01	95.2
			G RPR/RPLT MINOR PARTS	2.00	4.8	M PERIODIC/PHASED INSP	2.00	4.8
602 FAILED DUE TO OTHMAL	40.01	0.1	R REMOVE AND REPLACE	40.01	100.0	F BETWEEN FLT GND CREW	40.01	100.0
947 TORN	38.60	0.1	G RPR/RPLT MINOR PARTS	35.00	90.7	M PERIODIC/PHASED INSP	16.90	43.8
			R REMOVE AND REPLACE	3.60	9.3	F BETWEEN FLT GND CREW	11.67	30.2
						H POST/THRUFLT	10.03	26.0
966 RF WINDOW BROKEN-CRK	36.01	0.1	R REMOVE AND REPLACE	36.01	100.0	H POST/THRUFLT	36.01	100.0
160 CONTACTS/CONN DEFECT	34.70	0.1	G RPR/RPLT MINOR PARTS	34.70	100.0	F BETWEEN FLT GND CREW	20.70	59.7
						D INFLIGHT NO ABORT	7.00	20.2
						M PERIODIC/P.ASED INSP	5.00	14.4

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 5

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114H PILOT/COPILOT #1 (CONT.) $179,226 LSC/YEAR | PCT OF LSC 21.08 TOTAL | LSC RNK 1 | 28624.79 MAN HRS | PCT OF MHR 23.47 TOTAL | MHR RNK 1 | 100.8163 MANHR /1000 FLT HR

NOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						H POST/THRUFLT	2.00	5.8
230 DIRTY CONTAM SATURAT	31.27	0.1	V CLEAN	30.27	96.8	H POST/THRUFLT	23.70	75.8
			Z CORROSION REPAIR	1.00	3.2	M PERIODIC/PHASED INSP	6.23	19.9
						J PREFLIGHT	0.67	2.1
						R QC CHECK	0.67	2.1
667 RESISTANCE INCORRECT	28.01	0.1	R REMOVE AND REPLACE	28.01	100.0	H POST/THRUFLT	28.01	100.0
780 BENT,BUCKLED,COLLASP	26.01	0.1	A BNCH CK AND REPAIRED	24.00	92.3	F BETWEEN FLT GND CREW	24.00	92.3
			G RPR/RPLT MINOR PARTS	2.00	7.7	M PERIODIC/PHASED INSP	2.00	7.7
878 WEATHER DAMAGE	25.30	0.1	R REMOVE AND REPLACE	15.30	60.5	M PERIODIC/PHASED INSP	13.30	52.6
			G RPR/RPLT MINOR PARTS	10.00	39.5	B BEFORE FLT NO ABORT	12.00	47.4
170 CORRODED-MILD/MODRTE	23.80	0.1	Z CORROSION REPAIR	15.97	67.1	4 CORROSION CONTR INSP	12.07	50.7
			V CLEAN	6.00	25.2	F BETWEEN FLT GND CREW	6.00	25.2
			G RPR/RPLT MINOR PARTS	1.83	7.7	M PERIODIC/PHASED INSP	3.73	15.7
						R QC CHECK	2.00	8.4
116 CUT	21.80	0.1	G RPR/RPLT MINOR PARTS	19.50	89.4	M PERIODIC/PHASED INSP	16.80	77.1
			X TEST-INSPECT-SERVICE	2.30	10.6	H POST/THRUFLT	5.00	22.9
721 IMPROP RESP-ELEC IPT	18.00	0.1	P REMOVED	12.00	66.7	M PERIODIC/PHASED INSP	18.00	100.0
			R REMOVE AND REPLACE	6.00	33.3			
719 BRK/FRYED BND/GND WR	16.00	0.1	G RPR/RPLT MINOR PARTS	16.00	100.0	F BETWEEN FLT GND CREW	8.00	50.0
						M PERIODIC/PHASED INSP	5.00	31.3
						H POST/THRUFLT	3.00	18.8
804 LEAD BROKEN	16.00	0.1	G RPR/RPLT MINOR PARTS	14.00	87.5	D INFLIGHT NO ABORT	8.00	50.0
			Y TROUBLESHOOT	2.00	12.5	H POST/THRUFLT	6.00	37.5
						F BETWEEN FLT GND CREW	2.00	12.5
622 WET/CONDENSATION	15.00	0.1	G RPR/RPLT MINOR PARTS	15.00	100.0	M PERIODIC/PHASED INSP	15.00	100.0
450 OPEN	12.00	0.0	G RPR/RPLT MINOR PARTS	12.00	100.0	M PERIODIC/PHASED INSP	8.00	66.7
						F BETWEEN FLT GND CREW	4.00	33.3
080 DEFECTIVE LAMP/METER	10.00	0.0	R REMOVE AND REPLACE	10.00	100.0	M PERIODIC/PHASED INSP	10.00	100.0
667 CORRODED-SEVERE	8.00	0.0	P REMOVED	8.00	100.0	M PERIODIC/PHASED INSP	8.00	100.0
108 BRK/MSG SAFETY WIRE	6.80	0.0	G RPR/RPLT MINOR PARTS	6.80	100.0	M PERIODIC/PHASED INSP	4.30	63.2
						D INFLIGHT NO ABORT	2.00	29.4
						H POST/THRUFLT	0.50	7.4
804 NO DEF-SCH MAINT/MOD	6.00	0.0	G RPR/RPLT MINOR PARTS	6.00	100.0	F BETWEEN FLT GND CREW	6.00	100.0

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 6

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$650,348	121,987.68	429.63

1114M PILOT/COPILOT #1 (CONT.) $179,226 LSC/YEAR PCT OF LSC 21.08 TOTAL LSC RNK 1 28624.79 MAN HRS PCT OF MHR 23.47 TOTAL MHR RNK 1 100.8163 MANHR /1000 FLT HR

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF HMC
518	IMPROPER ROUTING	4.30	0.0	L	ADJUST	4.00	93.0	R	QC CHECK	4.00	93.0
				G	RPR/RPLT MINOR PARTS	0.30	7.0	M	PERIODIC/PHASED INSP	0.30	7.0
103	ATTACK DISP MALFUNC	9.00	0.0	G	RPR/RPLT MINOR PARTS	9.00	100.0	M	PERIODIC/PHASED INSP	9.00	100
086	IMPROPER HANDLING	2.00	0.0	G	RPR/RPLT MINOR PARTS	1.50	75.0	M	PERIODIC/PHASED INSP	1.00	50.0
				Y	TROUBLESHOOT	0.50	25.0	F	BETWEEN FL: GND CREW	0.50	25.0
								H	POST/THRUFLT	0.50	25.0
167	TORQUE INCORRECT	2.00	0.0	L	ADJUST	2.00	100.0	M	PERIODIC/PHASED INSP	2.00	100.0
660	STRIPPED	2.00	0.0	R	REMOVE AND REPLACE	2.00	100.0	M	PERIODIC/PHASED INSP	2.00	100.0
690	VIBRATION EXCESSIVE	1.00	0.0	G	RPR/RPLT MINOR PARTS	1.00	100.0	M	PERIODIC/PHASED INSP	1.00	100.0
955	DATA LINK ERROR	1.00	0.0	X	TEST-INSPECT-SERVICE	1.00	100.0	M	PERIODIC/PHASED INSP	1.00	100.0
997	RF WINDOW BURNED	1.00	0.0	G	RPR/RPLT MINOR PARTS	1.00	100.0	M	PERIODIC/PHASED INSP	1.00	100.0
025	CAPACITANCE INCORR	0.70	0.0	Y	TROUBLESHOOT	0.70	100.0	D	INFLIGHT NO ABORT	0.70	100.0
812	NO DEF-ASSOC EQP MAL	0.70	0.0	X	TEST-INSPECT-SERVICE	0.70	100.0	F	BETWEEN FLT GND CREW	0.70	100.0
350	INSULATION BREAKDOWN	0.50	0.0	G	RPR/RPLT MINOR PARTS	0.50	100.0	M	PERIODIC/PHASED INSP	0.50	100.0
425	NICKED	0.30	0.0	X	TEST-INSPECT-SERVICE	0.30	100.0	H	POST/THRUFLT	0.30	100.0

Figure A-2. KC-135A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING $86,490 LSC/YEAR | PCT OF LSC 10.17 TOTAL | LSC RNK 2 | 1215.08 MAN HRS | PCT OF MHR 9.93 TOTAL | MHR RNK 3 | 42.6892 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
799 NO DEFECT	2924.71	24.1	H EQUIP CK NO RPR RQRD	1751.75	59.9	H POST/THRUFLT	1589.63	54.4
			X TEST-INSPECT-SERVICE	721.58	24.7	M PERIODIC/PHASED INSP	979.95	33.5
			Q INSTALLED	384.18	13.1	F BETWEEN FLT GND CREW	322.74	11.0
			U RPLCD AFTER CANBLZTN	30.00	1.0	D INFLIGHT NO ABORT	12.50	0.4
			T REMOVE FOR CANIBLZTN	19.10	0.7	J PREFLIGHT	8.90	0.3
			R REMOVE AND REPLACE	9.60	0.3	R QC CHECK	8.00	0.3
			L ADJUST	6.00	0.2	B BEFORE FLT NO ABORT	2.00	0.1
			G RPR/RPLT MINOR PARTS	2.00	0.1	E AFTER FLIGHT	1.00	0.0
			P REMOVED	0.50	0.0			
105 LOOSE/DMGD BOLTS,NUT	2188.31	18.1	G RPR/RPLT MINOR PARTS	1969.45	90.0	M PERIODIC/PHASED INSP	1111.86	50.8
			F REPAIR	119.45	5.5	H POST/THRUFLT	579.55	26.5
			A BNCH CK AND REPAIRED	54.81	2.5	F BETWEEN FLT GND CREW	360.78	16.5
			L ADJUST	37.20	1.7	D INFLIGHT NO ABORT	55.01	2.5
			R REMOVE AND REPLACE	4.00	0.2	W IN-SHOP REPAIR	22.00	1.0
			X TEST-INSPECT-SERVICE	2.40	0.1	J PREFLIGHT	20.14	0.9
			Y TROUBLESHOOT	1.00	0.0	4 CORROSION CONTR INSP	18.00	0.8
						R QC CHECK	14.97	0.7
						S DEPOT LEVEL MAINTNCE	5.00	0.2
						P FUNCTIONAL CK FLT	1.00	0.0
108 MISSING BOLTS,NUTS..	1276.71	10.5	G RPR/RPLT MINOR PARTS	1128.09	88.4	H POST/THRUFLT	597.90	46.8
			F REPAIR	106.48	8.3	M PERIODIC/PHASED INSP	377.74	29.6
			A BNCH CK AND REPAIRED	36.51	2.9	F BETWEEN FLT GND CREW	285.77	22.4
			R REMOVE AND REPLACE	4.00	0.3	R QC CHECK	6.30	0.5
			L ADJUST	0.83	0.1	X ENGINE TEST STAND OP	4.00	0.3
			Q INSTALLED	0.50	0.0	N GROUND ALERT-DEGRAD	2.00	0.2
			Y CLEAN	0.30	0.0	J PREFLIGHT	1.00	0.1
						T SCHEDULED CALIBRZTN	1.00	0.1
						4 CORROSION CONTR INSP	1.00	0.1
192 CRACKED	1251.45	10.3	G RPR/RPLT MINOR PARTS	531.60	42.4	M PERIODIC/PHASED INSP	561.04	44.8
			R REMOVE AND REPLACE	346.99	27.7	H POST/THRUFLT	302.13	24.1
			F REPAIR	181.15	14.5	F BETWEEN FLT GND CREW	295.77	23.6
			A BNCH CK AND REPAIRED	163.05	13.0	D INFLIGHT NO ABORT	41.80	3.3
			P REMOVED	25.50	2.0	G GROUND ALERT-NOT DGR	36.01	2.9
			X TEST-INSPECT-SERVICE	5.00	0.4	J PREFLIGHT	16.70	1.3
			C BNCH CK-RPR DEFERRED	0.17	0.0			
946 DELAMINATED	703.22	5.8	R REMOVE AND REPLACE	520.60	74.0	F BETWEEN FLT GND CREW	294.72	41.9
			P REMOVED	92.51	13.2	H POST/THRUFLT	275.62	39.2
			X TEST-INSPECT-SERVICE	69.41	9.9	M PERIODIC/PHASED INSP	132.88	18.9
			G RPR/RPLT MINOR PARTS	15.10	2.1			
			A BNCH CK AND REPAIRED	5.00	0.7			
			J CLBRTD-NO ADJMT RQRD	0.60	0.1			
910 CHIPPED	478.98	4.0	R REMOVE AND REPLACE	410.84	85.8	H POST/THRUFLT	202.43	42.3

Figure A-2. KC-135A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING (CONT.) $86,490 LSC/YEAR | PCT OF LSC 10.17 | LSC RNK TOTAL 2 | 12115.08 MAN HRS | PCT OF MHR 9.93 | MHR RNK TOTAL 3 | 42.6692 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			P REMOVED	44.68	9.3	M PERIODIC/PHASED INSP	156.53	32.7
			Q INSTALLED	16.00	3.3	F BETWEEN FLT GND CREW	117.36	24.5
			X TEST-INSPECT-SERVICE	5.17	1.1	D INFLIGHT NO ABORT	2.67	0.6
			Y TROUBLESHOOT	2.00	0.4			
			G RPR/RPLT MINOR PARTS	0.30	0.1			
800 NO DEF-RMVD-OTH MAINT	431.98	3.6	S REMOVE AND REINSTALL	168.44	36.7	H POST/THRUFLT	361.78	83.7
			P REMOVED	116.15	26.9	F BETWEEN FLT GND CREW	51.80	12.0
			Q INSTALLED	100.85	23.3	M PERIODIC/PHASED INSP	15.80	3.7
			R REMOVE AND REPLACE	34.04	7.9	G GROUND ALERT-NOT DGR	1.80	0.4
			G RPR/RPLT MINOR PARTS	18.50	4.3	J PREFLIGHT	0.80	0.2
			X TEST-INSPECT-SERVICE	4.00	0.9			
935 SCORED OR SCRATCHED	404.71	3.3	R REMOVE AND REPLACE	319.07	78.8	H POST/THRUFLT	261.93	64.7
			P REMOVED	54.01	13.3	F BETWEEN FLT GND CREW	87.11	21.5
			X TEST-INSPECT-SERVICE	11.34	2.8	M PERIODIC/PHASED INSP	37.67	9.3
			Q INSTALLED	10.00	2.5	R QC CHECK	10.00	2.5
			G RPR/RPLT MINOR PARTS	8.00	2.0	S DEPOT LEVEL MAINTNCE	8.00	2.0
			Y TROUBLESHOOT	2.30	0.6			
127 ADJMT/ALGNMT IMPROPR	402.38	3.3	A BNCH CK AND REPAIRED	156.81	39.0	F BETWEEN FLT GND CREW	179.31	44.6
			G RPR/RPLT MINOR PARTS	130.15	32.3	H POST/THRUFLT	124.62	31.0
			F REPAIR	68.51	17.0	M PERIODIC/PHASED INSP	93.45	23.2
			L ADJUST	44.41	11.0	D INFLIGHT NO ABORT	5.00	1.2
			R REMOVE AND REPLACE	2.50	0.6			
117 DETERIORATED	392.74	3.2	G RPR/RPLT MINOR PARTS	243.19	61.9	M PERIODIC/PHASED INSP	261.06	66.5
			R REMOVE AND REPLACE	104.15	26.5	H POST/THRUFLT	71.70	18.3
			A BNCH CK AND REPAIRED	32.00	8.1	F BETWEEN FLT GND CREW	49.01	12.5
			X TEST-INSPECT-SERVICE	5.30	1.3	R QC CHECK	5.97	1.5
			F REPAIR	5.00	1.3	S DEPOT LEVEL MAINTNCE	5.00	1.3
			Q INSTALLED	2.00	0.5			
			Y TROUBLESHOOT	0.80	0.2			
			P REMOVED	0.30	0.1			
070 BROKEN	388.25	3.2	G RPR/RPLT MINOR PARTS	265.73	68.4	H POST/THRUFLT	179.02	46.1
			F REPAIR	67.51	17.4	F BETWEEN FLT GND CREW	112.51	29.0
			A BNCH CK AND REPAIRED	32.50	8.4	M PERIODIC/PHASED INSP	89.91	23.2
			R REMOVE AND REPLACE	20.50	5.3	J PREFLIGHT	6.30	1.6
			C BNCH CK-RPR DEFERRED	1.00	0.3	C INFLIGHT ABORT	0.50	0.1
			X TEST-INSPECT-SERVICE	1.00	0.3			
230 DIRTY CONTAM SATURAT	251.04	2.1	V CLEAN	244.90	97.6	M PERIODIC/PHASED INSP	178.26	71.0
			G RPR/RPLT MINOR PARTS	5.83	2.3	H POST/THRUFLT	58.14	23.2
			Z CORROSION REPAIR	0.30	0.1	R QC CHECK	9.64	3.8
						F BETWEEN FLT GND CREW	4.00	1.6
						D INFLIGHT NO ABORT	0.50	0.2
						J PREFLIGHT	0.50	0.2

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 9

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING (CONT.) $86,490 LSC/YEAR | PCT OF LSC 10.17 TOTAL | LSC RNK 2 | 12115.08 MAN HRS | PCT OF MHR 9.93 TOTAL | MHR RNK 3 | 42.6692 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
780 BENT,BUCKLED,COLLASP	202.80	1.7	F REPAIR	115.49	56.9	M PERIODIC/PHASED INSP	169.70	83.7
			G RPR/RPLT MINOR PARTS	66.51	32.8	F BETWEEN FLT GND CREW	21.80	10.7
			A BNCH CK AND REPAIRED	16.00	7.9	H POST/THRUFLT	10.30	5.1
			C BNCH CK-RPR DEFERRED	4.00	2.0	J PREFLIGHT	1.00	0.5
			R REMOVE AND REPLACE	0.80	0.4			
020 WORN CHAFED OR FRAYD	157.42	1.3	G RPR/RPLT MINOR PARTS	68.31	43.4	M PERIODIC/PHASED INSP	95.65	60.7
			F REPAIR	41.41	26.3	H POST/THRUFLT	40.11	25.5
			A BNCH CK AND REPAIRED	34.20	21.7	F BETWEEN FLT GND CREW	21.77	13.8
			R REMOVE AND REPLACE	12.00	7.6			
			Q INSTALLED	1.50	1.0			
170 CORRODED-MILD/MODRTE	112.58	0.9	Z CORROSION REPAIR	110.28	98.0	4 CORROSION CONTR INSP	62.37	55.4
			G RPR/RPLT MINOR PARTS	2.30	2.0	M PERIODIC/PHASED INSP	25.90	23.0
						S DEPOT LEVEL MAINTNCE	18.00	16.0
						F BETWEEN FLT GND CREW	2.00	1.8
						R QC CHECK	2.00	1.8
						J PREFLIGHT	1.00	0.9
						Q SPECIAL INSPECTION	1.00	0.9
						H POST/THRUFLT	0.30	0.3
730 LOOSE	69.94	0.6	G RPR/RPLT MINOR PARTS	41.34	59.1	M PERIODIC/PHASED INSP	38.80	55.5
			L ADJUST	18.30	26.2	H POST/THRUFLT	22.64	32.4
			R REMOVE AND REPLACE	10.00	14.3	F BETWEEN FLT GND CREW	8.50	12.2
			X TEST-INSPECT-SERVICE	0.30	0.4			
900 BURNED OR OVERHEATED	59.01	0.5	R REMOVE AND REPLACE	59.01	100.0	F BETWEEN FLT GND CREW	55.01	93.2
						H POST/THRUFLT	4.00	6.8
865 PROT COAT/SEALNT DEF	55.17	0.5	G RPR/RPLT MINOR PARTS	49.51	89.7	M PERIODIC/PHASED INSP	49.17	89.1
			R REMOVE AND REPLACE	4.00	7.3	F BETWEEN FLT GND CREW	6.00	10.9
			L ADJUST	1.00	1.8			
			Y TROUBLESHOOT	0.67	1.2			
805 NO DEF-NOC-OTH MAINT	50.24	0.4	G RPR/RPLT MINOR PARTS	19.40	38.6	F BETWEEN FLT GND CREW	40.74	81.1
			Q INSTALLED	17.84	35.5	M PERIODIC/PHASED INSP	5.50	10.9
			S REMOVE AND REINSTALL	13.00	25.9	D INFLIGHT NO ABORT	4.00	8.0
750 MISSING	48.67	0.4	G RPR/RPLT MINOR PARTS	33.67	69.2	H POST/THRUFLT	22.80	46.8
			A BNCH CK AND REPAIRED	10.00	20.5	M PERIODIC/PHASED INSP	16.87	34.7
			Q INSTALLED	5.00	10.3	F BETWEEN FLT GND CREW	8.00	16.4
						J PREFLIGHT	1.00	2.1
246 IMPROP/FAULTY MAINT	46.27	0.4	G RPR/RPLT MINOR PARTS	29.30	63.3	M PERIODIC/PHASED INSP	35.87	77.5
			F REPAIR	11.67	25.2	H POST/THRUFLT	9.50	20.5
			R REMOVE AND REPLACE	3.30	7.1	R QC CHECK	0.90	1.9
			L ADJUST	1.00	2.2			

Figure A-2. KC-135A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING (CONT.) $86,490 LSC/YEAR | PCT OF LSC 10.17 TOTAL | LSC RNK 2 | 12115.08 MAN HRS | PCT OF MHR 9.93 TOTAL | MHR RNK 3 | 42.6692 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			V CLEAN	1.00	2.2			
947 TORN	43.81	0.4	G RPR/RPLT MINOR PARTS	22.97	52.4	M PERIODIC/PHASED INSP	31.30	71.4
			R REMOVE AND REPLACE	20.84	47.6	H POST/THRUFLT	8.50	19.4
						F BETWEEN FLT GND CREW	4.00	9.1
605 CRAZED	26.97	0.2	R REMOVE AND REPLACE	18.30	67.9	H POST/THRUFLT	24.67	91.5
			F REPAIR	7.33	27.2	M PERIODIC/PHASED INSP	2.30	8.5
			C BNCH CK-RPR DEFERRED	1.33	4.9			
374 INTERNAL FAILURE	24.00	0.2	R REMOVE AND REPLACE	24.00	100.0	H POST/THRUFLT	16.00	66.7
						M PERIODIC/PHASED INSP	8.00	33.3
540 PUNCTURED	17.17	0.1	G RPR/RPLT MINOR PARTS	17.00	99.0	M PERIODIC/PHASED INSP	17.17	100.0
			X TEST-INSPECT-SERVICE	0.17	1.0			
942 ILLEGAL OPER/ADDRESS	16.00	0.1	R REMOVE AND REPLACE	16.00	100.0	M PERIODIC/PHASED INSP	16.00	100.0
804 NO DEF-SCH MAINT/MOD	12.20	0.1	S REMOVE AND REINSTALL	10.70	87.7	F BETWEEN FLT GND CREW	10.70	87.7
			R REMOVE AND REPLACE	1.50	12.3	H POST/THRUFLT	1.50	12.3
615 SHORTED	8.00	0.1	P REMOVED	8.00	100.0	D INFLIGHT NO ABORT	8.00	100.0
667 CORRODED-SEVERE	7.00	0.1	G RPR/RPLT MINOR PARTS	7.00	100.0	H POST/THRUFLT	7.00	100.0
660 STRIPPED	6.30	0.1	G RPR/RPLT MINOR PARTS	6.00	95.2	H POST/THRUFLT	6.30	100.0
			R REMOVE AND REPLACE	0.30	4.8			
116 CUT	6.00	0.0	G RPR/RPLT MINOR PARTS	6.00	100.0	H POST/THRUFLT	4.00	66.7
						M PERIODIC/PHASED INSP	2.00	33.3
601 DETONATION	6.00	0.0	R REMOVE AND REPLACE	6.00	100.0	H POST/THRUFLT	6.00	100.0
108 BRK/MSG SAFETY WIRE	5.90	0.0	G RPR/RPLT MINOR PARTS	5.60	94.9	R QC CHECK	4.00	67.8
			R REMOVE AND REPLACE	0.30	5.1	H POST/THRUFLT	1.30	22.0
						M PERIODIC/PHASED INSP	0.60	10.2
135 BINDING,STUCK,JAMMED	5.00	0.0	G RPR/RPLT MINOR PARTS	5.00	100.0	F BETWEEN FLT GND CREW	3.00	60.0
						M PERIODIC/PHASED INSP	2.00	40.0
242 FAILED TO OPERATE	5.00	0.0	Y TROUBLESHOOT	5.00	100.0	D INFLIGHT NO ABORT	5.00	100.0
350 INSULATION BREAKDOWN	4.50	0.0	G RPR/RPLT MINOR PARTS	4.50	100.0	H POST/THRUFLT	4.00	88.9
						M PERIODIC/PHASED INSP	0.50	11.1
622 WET/CONDENSATION	4.00	0.0	G RPR/RPLT MINOR PARTS	4.00	100.0	M PERIODIC/PHASED INSP	4.00	100.0
804 LEAD BROKEN	4.00	0.0	G RPR/RPLT MINOR PARTS	4.00	100.0	F BETWEEN FLT GND CREW	2.00	50.0

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 11

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114A BOOM SIGHTING (CONT.) $86,490 LSC/YEAR | PCT OF LSC 10.17 TOTAL | LSC RNK 2 | 12115.08 MAN HRS | PCT OF MHR 9.93 TOTAL | MHR RNK 3 | 42.6692 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						M PERIODIC/PHASED INSP	2.00	50.0
010 POOR OR INCORR FOCUS	3.67	0.0	R REMOVE AND REPLACE	3.67	100.0	M PERIODIC/PHASED INSP	3.67	100.0
080 DEFECTIVE LAMP/METER	3.00	0.0	F REPAIR	3.00	100.0	H POST/THRUFLT	3.00	100.0
518 IMPROPER ROUTING	2.00	0.0	L ADJUST	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
719 BRK/FRYED BND/GND WR	1.70	0.0	G RPR/RPLT MINOR PARTS	1.70	100.0	M PERIODIC/PHASED INSP	1.70	100.0
160 CONTACTS/CONN DEFECT	1.50	0.0	G RPR/RPLT MINOR PARTS L ADJUST	1.00 0.50	66.7 33.3	M PERIODIC/PHASED INSP J PREFLIGHT	1.00 0.50	66.7 33.3
425 NICKED	1.50	0.0	R REMOVE AND REPLACE	1.50	100.0	M PERIODIC/PHASED INSP	1.50	100.0
111 BURST OR RUPTURED	1.00	0.0	F REPAIR	1.00	100.0	H POST/THRUFLT	1.00	100.0
812 NO DEF-ASSOC EQP MAL	0.30	0.0	H EQUIP CK NO RPR RQRD	0.30	100.0	M PERIODIC/PHASED INSP	0.30	100.0
381 LEAKING INT OR EXT	0.00	0.0						

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 12

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114K PILOT/COPILOT #3 $76,542 LSC/YEAR | PCT OF LSC 9.00 TOTAL | LSC RNK 3 | 12765.07 MAN HRS | PCT OF MHR 10.46 TOTAL | MHR RNK 2 | 44.9585 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	6269.47	49.1	H EQUIP CK NO RPR RQRD	4212.65	67.2	H POST/THRUFLT	4309.86	68.7
			X TEST-INSPECT-SERVICE	1729.03	27.6	M PERIODIC/PHASED INSP	1380.99	22.0
			Q INSTALLED	292.99	4.7	F BETWEEN FLT GND CREW	431.12	6.9
			T REMOVE FOR CANIBLZTN	17.00	0.3	D INFLIGHT NO ABORT	67.61	1.1
			G RPR/RPLT MINOR PARTS	7.50	0.1	B BEFORE FLT NO ABORT	29.00	0.5
			W RPLCD AFTER CANBLZTN	5.00	0.1	J PREFLIGHT	16.30	0.3
			J CLBRTD-NO ADJMT RQRD	2.30	0.0	R QC CHECK	16.00	0.3
			F REPAIR	1.00	0.0	G GROUND ALERT-NOT DGR	6.70	0.1
			L ADJUST	1.00	0.0	U NON-DESTRUCTIVE INSP	4.00	0.1
			P REMOVED	1.00	0.0	X ENGINE TEST STAND OP	4.00	0.1
						4 CORROSION CONTR INSP	2.00	0.0
						K HOURLY POSTFLIGHT	1.90	0.0
105 LOOSE/DMGD BOLTS,NUT	1881.93	14.7	G RPR/RPLT MINOR PARTS	1741.21	92.5	H POST/THRUFLT	999.49	53.1
			L ADJUST	125.61	6.7	M PERIODIC/PHASED INSP	764.42	40.6
			X TEST-INSPECT-SERVICE	13.00	0.7	F BETWEEN FLT GND CREW	95.11	5.1
			Q INSTALLED	1.30	0.1	R QC CHECK	16.80	0.9
			R REMOVE AND REPLACE	0.50	0.0	D INFLIGHT NO ABORT	5.60	0.3
			F REPAIR	0.30	0.0	K HOURLY POSTFLIGHT	0.50	0.0
848 DELAMINATED	1348.01	10.6	R REMOVE AND REPLACE	775.88	57.6	H POST/THRUFLT	559.89	41.5
			P REMOVED	268.83	19.9	M PERIODIC/PHASED INSP	452.11	33.5
			X TEST-INSPECT-SERVICE	205.72	15.3	F BETWEEN FLT GND CREW	248.62	18.4
			Q INSTALLED	48.01	3.6	S DEPOT LEVEL MAINTNCE	69.00	5.1
			Y TROUBLESHOOT	24.60	1.8	4 CORROSION CONTR INSP	9.00	0.7
			G RPR/RPLT MINOR PARTS	18.20	1.4	D INFLIGHT NO ABORT	8.30	0.6
			V CLEAN	4.00	0.3	K HOURLY POSTFLIGHT	1.10	0.1
			7 BNCH CK-NRTS-EXCESS	1.10	0.1			
			L ADJUST	1.00	0.1			
			J CLBRTD-NO ADJMT RQRD	0.67	0.0			
190 CRACKED	1078.11	8.4	R REMOVE AND REPLACE	885.12	82.1	H POST/THRUFLT	579.94	53.8
			P REMOVED	99.88	9.3	M PERIODIC/PHASED INSP	221.50	20.5
			X TEST-INSPECT-SERVICE	36.60	3.4	F BETWEEN FLT GND CREW	121.52	11.3
			Q INSTALLED	28.01	2.6	D INFLIGHT NO ABORT	97.65	9.1
			G RPR/RPLT MINOR PARTS	22.40	2.1	B BEFORE FLT NO ABORT	28.01	2.6
			Y TROUBLESHOOT	6.10	0.6	J PREFLIGHT	12.50	1.2
						S DEPOT LEVEL MAINTNCE	12.00	1.1
						N GROUNT ALERT-DEGRAD	5.00	0.5
910 CHIPPED	579.17	4.5	R REMOVE AND REPLACE	521.16	90.0	H POST/THRUFLT	278.84	48.1
			P REMOVED	34.01	5.9	M PERIODIC/PHASED INSP	190.02	32.8
			Q INSTALLED	16.00	2.8	F BETWEEN FLT GND CREW	77.31	13.3
			X TEST-INSPECT-SERVICE	5.00	0.9	R QC CHECK	33.00	5.7
			G RPR/RPLT MINOR PARTS	2.00	0.3			
			1 BNCH CK-NRTS-NOT ATH	1.00	0.2			

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 13

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114K PILOT/COPILOT #3 (CONT.) $76,542 LSC/YEAR | PCT OF LSC 9.00 TOTAL | LSC RNK 3 | 12765.07 MAN HRS | PCT OF MHR 10.46 TOTAL | MHR RNK 2 | 44.9585 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
117 DETERIORATED	420.47	3.3	G RPR/RPLT MINOR PARTS	280.80	66.8	M PERIODIC/PHASED INSP	304.90	72.5
			R REMOVE AND REPLACE	106.91	25.4	H POST/THRUFLT	57.64	13.7
			X TEST-INSPECT-SERVICE	24.67	5.9	F BETWEEN FLT GND CREW	33.61	8.0
			Q INSTALLED	5.00	1.2	R QC CHECK	16.34	3.9
			F REPAIR	2.10	0.5	J PREFLIGHT	8.00	1.9
			P REMOVED	1.00	0.2			
935 SCORED OR SCRATCHED	206.42	1.6	R REMOVE AND REPLACE	138.18	66.9	H POST/THRUFLT	135.41	65.6
			X TEST-INSPECT-SERVICE	54.24	26.3	M PERIODIC/PHASED INSP	42.00	20.3
			P REMOVED	12.00	5.8	F BETWEEN FLT GND CREW	23.00	11.1
			Y TROUBLESHOOT	2.00	1.0	R QC CHECK	6.00	2.9
730 LOOSE	154.51	1.2	L ADJUST	77.70	50.3	H POST/THRUFLT	87.41	56.6
			G RPR/RPLT MINOR PARTS	66.01	42.7	M PERIODIC/PHASED INSP	53.60	34.7
			X TEST-INSPECT-SERVICE	6.30	4.1	F BETWEEN FLT GND CREW	7.00	4.5
			R REMOVE AND REPLACE	2.50	1.6	D INFLIGHT NO ABORT	4.00	2.6
			F REPAIR	2.00	1.3	R QC CHECK	1.50	1.0
						4 CORROSION CONTR INSP	1.00	0.6
106 MISSING BOLTS,NUTS..	124.90	1.0	G RPR/RPLT MINOR PARTS	120.40	96.4	M PERIODIC/PHASED INSP	64.06	51.3
			E INITIAL INSTALLATION	2.00	1.6	H POST/THRUFLT	31.54	25.3
			Y TROUBLESHOOT	1.80	1.4	F BETWEEN FLT GND CREW	15.70	12.6
			X TEST-INSPECT-SERVICE	0.50	0.4	R QC CHECK	13.10	10.5
			L ADJUST	0.20	0.2	J PREFLIGHT	0.50	0.4
020 WORN CHAFED OR FRAYD	91.58	0.7	G RPR/RPLT MINOR PARTS	76.97	84.0	F BETWEEN FLT GND CREW	38.14	41.6
			R REMOVE AND REPLACE	14.10	15.4	H POST/THRUFLT	36.50	39.9
			Y TROUBLESHOOT	0.50	0.5	M PERIODIC/PHASED INSP	11.93	13.0
						B BEFORE FLT NO ABORT	3.00	3.3
						D INFLIGHT NO ABORT	2.00	2.2
865 PROT COAT/SEALNT DEF	80.18	0.6	G RPR/RPLT MINOR PARTS	80.18	100.0	M PERIODIC/PHASED INSP	53.68	66.9
						H POST/THRUFLT	22.00	27.4
						F BETWEEN FLT GND CREW	2.50	3.1
						4 CORROSION CONTR INSP	2.00	2.5
800 NO DEF-RMVD-OTH MAINT	74.91	0.6	Q INSTALLED	38.50	51.4	F BETWEEN FLT GND CREW	39.70	53.0
			P REMOVED	20.40	27.2	H POST/THRUFLT	32.00	42.7
			X TEST-INSPECT-SERVICE	8.00	10.7	M PERIODIC/PHASED INSP	2.00	2.7
			G RPR/RPLT MINOR PARTS	6.00	8.0	S DEPOT LEVEL MAINTNCE	1.20	1.6
			S REMOVE AND REINSTALL	2.00	2.7			
127 ADJMT/ALGNMT IMPROPR	71.11	0.6	L ADJUST	58.81	82.7	F BETWEEN FLT GND CREW	25.70	36.1
			G RPR/RPLT MINOR PARTS	8.30	11.7	H POST/THRUFLT	21.50	30.2
			X TEST-INSPECT-SERVICE	2.00	2.8	M PERIODIC/PHASED INSP	19.90	28.0
			Y TROUBLESHOOT	2.00	2.8	B BEFORE FLT NO ABORT	2.00	2.8
						R QC CHECK	2.00	2.8

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS DNAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 14

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114K PILOT/COPILOT #3 (CONT.) $76.542 LSC/YEAR | PCT OF LSC 9.00 TOTAL | LSC RNK 3 | 12765.07 MAN HRS | PCT OF MHR 10.46 TOTAL | MHR RNK 2 | 44.9585 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
900 BURNED OR OVERHEATED	61.71	0.5	R REMOVE AND REPLACE	60.71	98.4	Q INFLIGHT NO ABORT	30.70	49.7
			G RPR/RPLT MINOR PARTS	1.00	1.6	H POST/THRUFLT	16.00	25.9
						M PERIODIC/PHASED INSP	14.00	22.7
						F BETWEEN FLT GND CREW	1.00	1.6
805 NO DEF-NOC-OTH MAINT	59.34	0.5	G RPR/RPLT MINOR PARTS	55.01	92.7	F BETWEEN FLT GND CREW	39.14	66.0
			Q INSTALLED	4.33	7.3	M PERIODIC/PHASED INSP	18.20	30.7
						H POST/THRUFLT	2.00	3.4
750 MISSING	49.34	0.4	G RPR/RPLT MINOR PARTS	26.03	52.8	M PERIODIC/PHASED INSP	26.50	53.7
			Q INSTALLED	19.00	38.5	H POST/THRUFLT	12.83	26.0
			F REPAIR	2.30	4.7	F BETWEEN FLT GND CREW	10.00	20.3
			R REMOVE AND REPLACE	2.00	4.1			
070 BROKEN	32.57	0.3	G RPR/RPLT MINOR PARTS	26.27	80.7	F BETWEEN FLT GND CREW	15.00	46.1
			R REMOVE AND REPLACE	5.50	16.9	H POST/THRUFLT	6.30	19.3
			F REPAIR	0.80	2.5	M PERIODIC/PHASED INSP	5.87	18.0
						D INFLIGHT NO ABORT	4.00	12.3
						J PREFLIGHT	1.40	4.3
374 INTERNAL FAILURE	26.00	0.2	P REMOVED	12.00	46.2	H POST/THRUFLT	12.00	46.2
			R REMOVE AND REPLACE	8.00	30.8	J PREFLIGHT	8.00	30.8
			Y TROUBLESHOOT	6.00	23.1	Q INFLIGHT NO ABORT	6.00	23.1
947 TORN	22.54	0.2	G RPR/RPLT MINOR PARTS	22.54	100.0	M PERIODIC/PHASED INSP	9.63	42.7
						H POST/THRUFLT	8.00	35.5
						F BETWEEN FLT GND CREW	4.90	21.7
230 DIRTY CONTAM SATURAT	12.42	0.1	V CLEAN	9.62	77.5	H POST/THRUFLT	8.87	71.4
			Q INSTALLED	2.00	16.1	M PERIODIC/PHASED INSP	2.55	20.5
			X TEST-INSPECT-SERVICE	0.50	4.0	R QC CHECK	1.00	8.1
			G RPR/RPLT MINOR PARTS	0.30	2.4			
719 BRK/FRYED BND/GND WR	12.00	0.1	G RPR/RPLT MINOR PARTS	12.00	100.0	F BETWEEN FLT GND CREW	12.00	100.0
246 IMPROP/FAULTY MAINT	10.97	0.1	G RPR/RPLT MINOR PARTS	6.30	57.4	R QC CHECK	5.67	51.7
			P REMOVED	3.00	27.3	M PERIODIC/PHASED INSP	5.30	48.3
			X TEST-INSPECT-SERVICE	1.00	9.1			
			L ADJUST	0.67	6.1			
425 NICKED	10.00	0.1	R REMOVE AND REPLACE	9.00	90.0	M PERIODIC/PHASED INSP	10.00	100.0
			Y TROUBLESHOOT	1.00	10.0			
160 CONTACTS/CONN DEFECT	8.80	0.1	G RPR/RPLT MINOR PARTS	3.80	43.2	F BETWEEN FLT GND CREW	3.00	34.1
			R REMOVE AND REPLACE	3.00	34.1	H POST/THRUFLT	2.30	26.1
			L ADJUST	2.00	22.7	M PERIODIC/PHASED INSP	2.00	22.7
						R QC CHECK	1.00	11.4
						D INFLIGHT NO ABORT	0.50	5.7

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 15

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114K PILOT/COPILOT #3 (CONT.) $76,542 LSC/YEAR PCT OF LSC 9.00 TOTAL LSC RNK 3 12765.07 MAN HRS PCT OF MHR 10.46 TOTAL MHR RNK 2 44.9585 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
242 FAILED TO OPERATE	8.50	0.1	G RPR/RPLT MINOR PARTS	6.00	70.6	D INFLIGHT NO ABORT	6.50	76.5
			Y TROUBLESHOOT	2.50	29.4	F BETWEEN FLT GND CREW	2.00	23.5
518 IMPROPER ROUTING	8.50	0.1	L ADJUST	4.50	52.9	M PERIODIC/PHASED INSP	3.50	41.2
			G RPR/RPLT MINOR PARTS	3.00	35.3	F BETWEEN FLT GND CREW	3.00	35.3
			X TEST-INSPECT-SERVICE	1.00	11.8	R QC CHECK	2.00	23.5
884 LEAD BROKEN	8.50	0.1	G RPR/RPLT MINOR PARTS	8.50	100.0	F BETWEEN FLT GND CREW	5.50	64.7
						H POST/THRUFLT	2.00	23.5
						4 CORROSION CONTR INSP	1.00	11.8
605 CRAZED	8.00	0.1	R REMOVE AND REPLACE	8.00	100.0	F BETWEEN FLT GND CREW	8.00	100.0
660 STRIPPED	8.00	0.1	R REMOVE AND REPLACE	6.00	75.0	H POST/THRUFLT	4.00	50.0
			G RPR/RPLT MINOR PARTS	2.00	25.0	M PERIODIC/PHASED INSP	4.00	50.0
780 BENT,BUCKLED,COLLASP	7.40	0.1	G RPR/RPLT MINOR PARTS	7.40	100.0	H POST/THRUFLT	5.00	67.6
						F BETWEEN FLT GND CREW	2.00	27.0
						M PERIODIC/PHASED INSP	0.40	5.4
615 SHORTED	6.00	0.0	G RPR/RPLT MINOR PARTS	6.00	100.0	B BEFORE FLT NO ABORT	6.00	100.0
350 INSULATION BREAKDOWN	4.50	0.0	G RPR/RPLT MINOR PARTS	4.50	100.0	F BETWEEN FLT GND CREW	4.00	88.9
						M PERIODIC/PHASED INSP	0.50	11.1
170 CORRODED-MILD/MODRTE	3.77	0.0	G RPR/RPLT MINOR PARTS	2.00	53.1	F BETWEEN FLT GND CREW	2.00	53.1
			Z CORROSION REPAIR	1.77	46.9	M PERIODIC/PHASED INSP	1.10	29.2
						4 CORROSION CONTR INSP	0.67	17.8
948 NO DEF-OPERATOR ERR	2.33	0.0	H EQUIP CK NO RPR RQRD	2.33	100.0	D INFLIGHT NO ABORT	2.33	100.0
622 WET/CONDENSATION	2.00	0.0	Y TROUBLESHOOT	2.00	100.0	A BEFORE FLT ABORT	2.00	100.0
812 NO DEF-ASSOC EQP MAL	2.00	0.0	Y TROUBLESHOOT	2.00	100.0	H POST/THRUFLT	2.00	100.0
878 WEATHER DAMAGE	2.00	0.0	G RPR/RPLT MINOR PARTS	2.00	100.0	M PERIODIC/PHASED INSP	2.00	100.0
116 CUT	1.83	0.0	G RPR/RPLT MINOR PARTS	1.83	100.0	M PERIODIC/PHASED INSP	1.83	100.0
804 NO DEF-SCH MAINT/MOD	1.80	0.0	G RPR/RPLT MINOR PARTS	1.80	100.0	F BETWEEN FLT GND CREW	1.80	100.0
108 BRK/MSG SAFETY WIRE	1.50	0.0	L ADJUST	1.50	100.0	H POST/THRUFLT	1.50	100.0
135 BINDING,STUCK,JAMMED	1.50	0.0	G RPR/RPLT MINOR PARTS	1.50	100.0	M PERIODIC/PHASED INSP	1.50	100.0
086 IMPROPER HANDLING	0.50	0.0	Y TROUBLESHOOT	0.50	100.0	F BETWEEN FLT GND CREW	0.50	100.0

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 16

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

11194 PILOT/COPILOT #2 $70,374 LSC/YEAR | PCT OF LSC 8.28 TOTAL | LSC RNK 4 | 8208.81 MAN HRS | PCT OF MHR 6.73 TOTAL | MHR RNK 8 | 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
799 NO DEFECT	3576.87	43.6	H EQUIP CK NO RPR RQRD	2209.18	61.8	H POST/THRUFLT	2179.02	60.9
			X TEST-INSPECT-SERVICE	1016.48	28.4	M PERIODIC/PHASED INSP	758.18	21.2
			T REMOVE FOR CANIBLZTN	136.42	3.8	F BETWEEN FLT GND CREW	528.69	14.8
			Q INSTALLED	122.55	3.4	D INFLIGHT NO ABORT	50.07	1.4
			U RPLCD AFTER CANBLZTN	79.74	2.2	E AFTER FLIGHT	32.01	0.9
			J CLBRTD-NO ADJMT RQRD	4.50	0.1	J PREFLIGHT	13.00	0.4
			R REMOVE AND REPLACE	4.00	0.1	B BEFORE FLT NO ABORT	7.20	0.2
			G RPR/RPLT MINOR PARTS	3.00	0.1	S DEPOT LEVEL MAINTNCE	4.00	0.1
			F REPAIR	1.00	0.0	G GROUND ALERT-NOT DGR	2.00	0.1
						K HOURLY POSTFLIGHT	1.00	0.0
						Q SPECIAL INSPECTION	0.50	0.0
						R QC CHECK	0.30	0.0
105 LOOSE/DMGD BOLTS,NUT	681.51	8.3	G RPR/RPLT MINOR PARTS	653.07	95.8	M PERIODIC/PHASED INSP	270.93	39.8
			L ADJUST	17.13	2.5	H POST/THRUFLT	229.16	33.6
			X TEST-INSPECT-SERVICE	6.00	0.9	F BETWEEN FLT GND CREW	143.31	21.0
			A BNCH CK AND REPAIRED	4.00	0.6	D INFLIGHT NO ABORT	16.80	2.5
			R REMOVE AND REPLACE	1.30	0.2	R QC CHECK	11.10	1.6
						B BEFORE FLT NO ABORT	10.20	1.5
946 DELAMINATED	585.67	7.1	R REMOVE AND REPLACE	325.14	55.5	M PERIODIC/PHASED INSP	199.25	34.0
			X TEST-INSPECT-SERVICE	166.71	28.5	H POST/THRUFLT	155.75	26.6
			P REMOVED	66.01	11.3	F BETWEEN FLT GND CREW	136.82	23.4
			1 BNCH CK-NRTS-NOT ATH	12.50	2.1	J PREFLIGHT	66.01	11.3
			F REPAIR	5.00	0.9	E AFTER FLIGHT	17.34	3.0
			G RPR/RPLT MINOR PARTS	3.80	0.6	K HOURLY POSTFLIGHT	4.50	0.8
			9 BNCH CK-CONDEMNED	2.50	0.4	D INFLIGHT NO ABORT	3.00	0.5
			Y TROUBLESHOOT	2.00	0.3	W IN-SHOP REPAIR	2.00	0.3
			L ADJUST	1.00	0.2	2	1.00	0.2
			B BNCH CK-RTN TO DEPOT	1.00	0.2			
805 NO DEF-NOC-OTH MAINT	387.51	4.7	G RPR/RPLT MINOR PARTS	235.72	60.8	F BETWEEN FLT GND CREW	261.73	67.5
			Q INSTALLED	113.45	29.3	M PERIODIC/PHASED INSP	77.98	20.1
			S REMOVE AND REINSTALL	21.00	5.4	D INFLIGHT NO ABORT	30.00	7.7
			P REMOVED	11.34	2.9	H POST/THRUFLT	8.30	2.1
			X TEST-INSPECT-SERVICE	6.00	1.5	G GROUND ALERT-NOT DGR	8.00	2.1
						B BEFORE FLT NO ABORT	1.50	0.4
127 ADJMT/ALGNMT IMPROPR	385.64	4.7	L ADJUST	353.54	91.7	F BETWEEN FLT GND CREW	123.51	32.0
			G RPR/RPLT MINOR PARTS	21.80	5.7	H POST/THRUFLT	97.51	25.3
			X TEST-INSPECT-SERVICE	4.00	1.0	M PERIODIC/PHASED INSP	67.21	17.4
			A BNCH CK AND REPAIRED	2.00	0.5	D INFLIGHT NO ABORT	54.01	14.0
			1 BNCH CK-NRTS-NOT ATH	2.00	0.5	G GROUND ALERT-NOT DGR	23.00	6.0
			4 BNCH CK-NRTS-LCK PTS	2.00	0.5	B BEFORE FLT NO ABORT	7.60	2.0
			R REMOVE AND REPLACE	0.30	0.1	A BEFORE FLT ABORT	4.00	1.0
						J PREFLIGHT	3.80	1.0
						S DEPOT LEVEL MAINTNCE	3.00	0.8

Figure A-2. KC-135A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114J PILOT/COPILOT #2 (CONT.) $70,374 LSC/YEAR | PCT OF LSC 8.28 TOTAL | LSC RNK 4 | 8208.81 MAN HRS | PCT OF MHR 6.73 TOTAL | MHR RNK 8 | 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						W IN-SHOP REPAIR	2.00	0.5
190 CRACKED	319.83	3.9	R REMOVE AND REPLACE	177.62	55.5	H POST/THRUFLT	147.88	46.2
			1 BNCH CK-NRTS-NOT ATH	31.47	9.8	F BETWEEN FLT GND CREW	113.72	35.6
			G RPR/RPLT MINOR PARTS	26.94	8.4	M PERIODIC/PHASED INSP	37.24	11.6
			X TEST-INSPECT-SERVICE	24.00	7.5	D INFLIGHT NO ABORT	14.00	4.4
			P REMOVED	21.00	6.6	J PREFLIGHT	7.00	2.2
			A BNCH CK AND REPAIRED	13.70	4.3			
			F REPAIR	13.50	4.2			
			9 BNCH CK-CONDENNED	5.00	1.6			
			B BNCH CK-RTN TO DEPOT	3.80	1.2			
			C BNCH CK-RPR DEFERRED	2.00	0.6			
			Y TROUBLESHOOT	0.80	0.3			
020 WORN CHAFED OR FRAYD	303.20	3.7	G RPR/RPLT MINOR PARTS	261.70	86.3	F BETWEEN FLT GND CREW	195.56	64.5
			R REMOVE AND REPLACE	41.51	13.7	H POST/THRUFLT	61.74	20.4
						M PERIODIC/PHASED INSP	29.20	9.6
						D INFLIGHT NO ABORT	9.50	3.1
						R QC CHECK	4.50	1.5
						B BEFORE FLT NO ABORT	2.00	0.7
						J PREFLIGHT	0.70	0.2
117 DETERIORATED	292.00	3.6	G RPR/RPLT MINOR PARTS	192.86	66.0	M PERIODIC/PHASED INSP	195.96	67.1
			R REMOVE AND REPLACE	79.45	27.2	F BETWEEN FLT GND CREW	52.68	18.0
			X TEST-INSPECT-SERVICE	19.70	6.7	H POST/THRUFLT	34.57	11.8
						R QC CHECK	4.50	1.5
						D INFLIGHT NO ABORT	3.30	1.1
						C INFLIGHT ABORT	1.00	0.3
106 MISSING BOLTS,NUTS..	193.39	2.4	G RPR/RPLT MINOR PARTS	177.92	92.0	M PERIODIC/PHASED INSP	94.74	49.0
			F REPAIR	4.00	2.1	H POST/THRUFLT	62.27	32.2
			L ADJUST	3.50	1.8	F BETWEEN FLT GND CREW	22.70	11.7
			X TEST-INSPECT-SERVICE	3.30	1.7	D INFLIGHT NO ABORT	8.00	4.1
			R REMOVE AND REPLACE	2.67	1.4	R QC CHECK	3.67	1.9
			A BNCH CK AND REPAIRED	2.00	1.0	J PREFLIGHT	2.00	1.0
935 SCORED OR SCRATCHED	187.06	2.3	R REMOVE AND REPLACE	83.64	44.7	H POST/THRUFLT	104.01	55.6
			X TEST-INSPECT-SERVICE	71.91	38.4	M PERIODIC/PHASED INSP	57.84	30.9
			P REMOVED	16.00	8.6	F BETWEEN FLT GND CREW	23.20	12.4
			1 BNCH CK-NRTS-NOT ATH	8.30	4.4	R QC CHECK	2.00	1.1
			Y TROUBLESHOOT	4.00	2.1			
			G RPR/RPLT MINOR PARTS	2.00	1.1			
			9 BNCH CK-CONDENNED	1.00	0.5			
			B BNCH CK-RTN TO DEPOT	0.20	0.1			
070 BROKEN	165.82	2.0	G RPR/RPLT MINOR PARTS	85.51	51.6	F BETWEEN FLT GND CREW	54.81	33.1
			F REPAIR	29.17	17.6	M PERIODIC/PHASED INSP	47.17	28.4
			R REMOVE AND REPLACE	25.00	15.1	S DEPOT LEVEL MAINTNCE	20.20	12.2

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS QNAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 18

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114J PILOT/COPILOT #2 (CONT.) $70,374 LSC/YEAR | PCT OF LSC 8.28 TOTAL | LSC RNK 4 | 8208.81 MAN HRS | PCT OF MHR 6.73 TOTAL | MHR RNK 8 | 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			A BNCH CK AND REPAIRED	12.80	7.7	H POST/THRUFLT	18.50	11.2
			Y TROUBLESHOOT	7.50	4.5	W IN-SHOP REPAIR	14.00	8.4
			P REMOVED	3.83	2.3	B BEFORE FLT NO ABORT	10.00	6.0
			1 BNCH CK-NRTS-NOT ATH	1.00	0.6	D INFLIGHT NO ABORT	1.13	0.7
			9 BNCH CK-CONDEMNED	1.00	0.6			
800 NO DEF-RMVD-OTH MAINT	160.14	2.0	Q INSTALLED	81.50	50.9	F BETWEEN FLT GND CREW	119.64	74.7
			G RPR/RPLT MINOR PARTS	37.43	23.4	M PERIODIC/PHASED INSP	28.00	17.5
			S REMOVE AND REINSTALL	29.00	18.1	B BEFORE FLT NO ABORT	8.00	5.0
			P REMOVED	12.20	7.6	D INFLIGHT NO ABORT	2.50	1.6
						H POST/THRUFLT	2.00	1.2
750 MISSING	114.51	1.4	G RPR/RPLT MINOR PARTS	75.04	65.5	M PERIODIC/PHASED INSP	47.41	41.4
			Q INSTALLED	31.37	27.4	F BETWEEN FLT GND CREW	29.00	25.3
			R REMOVE AND REPLACE	8.10	7.1	H POST/THRUFLT	24.94	21.8
						B BEFORE FLT NO ABORT	8.00	7.0
						J PREFLIGHT	3.00	2.6
						D INFLIGHT NO ABORT	1.17	1.0
						S DEPOT LEVEL MAINTNCE	1.00	0.9
884 LEAD BROKEN	101.08	1.2	G RPR/RPLT MINOR PARTS	95.78	94.8	F BETWEEN FLT GND CREW	43.31	42.8
			Q INSTALLED	4.00	4.0	D INFLIGHT NO ABORT	28.00	27.7
			X TEST-INSPECT-SERVICE	1.30	1.3	M PERIODIC/PHASED INSP	17.77	17.6
						H POST/THRUFLT	12.00	11.9
730 LOOSE	95.81	1.2	G RPR/RPLT MINOR PARTS	77.81	81.2	H POST/THRUFLT	35.41	37.0
			L ADJUST	16.67	17.4	M PERIODIC/PHASED INSP	31.74	33.1
			F REPAIR	0.83	0.9	R QC CHECK	14.50	15.1
			X TEST-INSPECT-SERVICE	0.50	0.5	F BETWEEN FLT GND CREW	9.17	9.6
						D INFLIGHT NO ABORT	4.00	4.2
						K HOURLY POSTFLIGHT	1.00	1.0
910 CHIPPED	81.98	1.0	R REMOVE AND REPLACE	65.51	79.9	H POST/THRUFLT	49.81	60.8
			1 BNCH CK-NRTS-NOT ATH	9.17	11.2	M PERIODIC/PHASED INSP	26.00	31.7
			X TEST-INSPECT-SERVICE	2.00	2.4	F BETWEEN FLT GND CREW	4.00	4.9
			4 BNCH CK-NRTS-LCK PTS	2.00	2.4	X ENGINE TEST STAND OP	2.17	2.6
			G RPR/RPLT MINOR PARTS	1.30	1.6			
			Y TROUBLESHOOT	1.00	1.2			
			B BNCH CK-RTN TO DEPOT	1.00	1.2			
180 CONTACTS/CONN DEFECT	79.01	1.0	G RPR/RPLT MINOR PARTS	67.01	84.8	F BETWEEN FLT GND CREW	38.50	48.7
			R REMOVE AND REPLACE	12.00	15.2	D INFLIGHT NO ABORT	22.00	27.8
						M PERIODIC/PHASED INSP	17.70	22.4
						R QC CHECK	0.80	1.0
900 BURNED OR OVERHEATED	70.21	0.9	R REMOVE AND REPLACE	52.20	74.3	H POST/THRUFLT	31.10	44.3
			B BNCH CK-RTN TO DEPOT	8.30	11.8	F BETWEEN FLT GND CREW	20.60	29.3
			Y TROUBLESHOOT	4.30	6.1	R QC CHECK	9.30	13.2

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 19

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114J PILOT/COPILOT #2 (CONT.) $70,374 LSC/YEAR | PCT OF LSC 8.28 TOTAL | LSC RNK 4 | 8208.81 MAN HRS | PCT OF MHR 6.73 TOTAL | MHR RNK 8 | 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			G RPR/RPLT MINOR PARTS	2.80	4.0	S DEPOT LEVEL MAINTNCE	5.70	8.1
			X TEST-INSPECT-SERVICE	1.30	1.9	M PERIODIC/PHASED INSP	3.50	5.0
			1 BNCH CK-NRTS-NOT ATH	1.30	1.9			
381 LEAKING INT OR EXT	64.01	0.8	R REMOVE AND REPLACE	25.34	39.6	F BETWEEN FLT GND CREW	29.34	45.8
			G RPR/RPLT MINOR PARTS	20.67	32.3	D INFLIGHT NO ABORT	21.00	32.8
			Y TROUBLESHOOT	10.00	15.6	M PERIODIC/PHASED INSP	7.67	12.0
			L ADJUST	4.00	6.2	R QC CHECK	6.00	9.4
			9 BNCH CK-CONDENNED	4.00	6.2			
947 TORN	47.51	0.6	G RPR/RPLT MINOR PARTS	37.11	78.1	F BETWEEN FLT GND CREW	15.80	33.3
			R REMOVE AND REPLACE	6.10	12.8	M PERIODIC/PHASED INSP	15.37	32.4
			L ADJUST	4.00	8.4	H POST/THRUFLT	13.84	29.1
			Q INSTALLED	0.30	0.6	K HOURLY POSTFLIGHT	1.50	3.2
						D INFLIGHT NO ABORT	1.00	2.1
667 CORRODED-SEVERE	39.01	0.5	R REMOVE AND REPLACE	39.01	100.0	H POST/THRUFLT	39.01	100.0
567 RESISTANCE INCORRECT	37.81	0.5	R REMOVE AND REPLACE	24.00	63.5	M PERIODIC/PHASED INSP	25.00	66.1
			Y TROUBLESHOOT	8.80	23.3	F BETWEEN FLT GND CREW	7.50	19.8
			L ADJUST	4.00	10.6	D INFLIGHT NO ABORT	4.00	10.6
			9 BNCH CK-CONDENNED	1.00	2.6	H POST/THRUFLT	1.30	3.4
474 INTERNAL FAILURE	34.10	0.4	R REMOVE AND REPLACE	20.00	58.7	D INFLIGHT NO ABORT	22.00	64.5
			Y TROUBLESHOOT	10.10	29.6	E AFTER FLIGHT	9.00	26.4
			1 BNCH CK-NRTS-NOT ATH	2.00	5.9	F BETWEEN FLT GND CREW	2.00	5.9
			6 BNCH CK-NRTS-LCK DAT	2.00	5.9	H POST/THRUFLT	0.80	2.3
						M PERIODIC/PHASED INSP	0.30	0.9
170 CORRODED-MILD/MODRTE	32.60	0.4	Z CORROSION REPAIR	14.90	45.7	4 CORROSION CONTR INSP	8.70	26.7
			G RPR/RPLT MINOR PARTS	7.70	23.6	M PERIODIC/PHASED INSP	7.20	22.1
			V CLEAN	7.00	21.5	F BETWEEN FLT GND CREW	5.70	17.5
			R REMOVE AND REPLACE	3.00	9.2	D INFLIGHT NO ABORT	5.00	15.3
						H POST/THRUFLT	4.00	12.3
						R QC CHECK	2.00	6.1
242 FAILED TO OPERATE	21.34	0.3	Y TROUBLESHOOT	19.34	90.6	F BETWEEN FLT GND CREW	12.67	59.4
			R REMOVE AND REPLACE	2.00	9.4	D INFLIGHT NO ABORT	3.00	14.1
						H POST/THRUFLT	2.00	9.4
						M PERIODIC/PHASED INSP	2.00	9.4
						B BEFORE FLT NO ABORT	1.67	7.8
135 BINDING,STUCK,JAMMED	19.00	0.2	G RPR/RPLT MINOR PARTS	10.00	52.6	M PERIODIC/PHASED INSP	17.00	89.5
			R REMOVE AND REPLACE	6.00	31.6	F BETWEEN FLT GND CREW	2.00	10.5
			L ADJUST	3.00	15.8			
719 BRK/FRYED BND/GND WR	15.34	0.2	G RPR/RPLT MINOR PARTS	14.34	93.5	F BETWEEN FLT GND CREW	11.34	73.9
			X TEST-INSPECT-SERVICE	1.00	6.5	H POST/THRUFLT	3.00	19.6

Figure A-2. KC-135A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114J PILOT/COPILOT #2 (CONT.) — $70,374 LSC/YEAR; PCT OF LSC 8.28 TOTAL; LSC RNK 4; 8208.81 MAN HRS; PCT OF MHR 6.73 TOTAL; MHR RNK 8; 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WMC
						M PERIODIC/PHASED INSP	1.00	6.2
246 IMPROP/FAULTY MAINT	12.90	0.2	A BNCH CK AND REPAIRED	8.00	62.0	J PREFLIGHT	8.00	62.0
			G RPR/RPLT MINOR PARTS	4.40	34.1	M PERIODIC/PHASED INSP	3.90	30.2
			F REPAIR	0.50	3.9	H POST/THRUFLT	0.50	3.9
						R QC CHECK	0.50	3.9
605 CHAZED	12.00	0.1	R REMOVE AND REPLACE	12.00	100.0	S DEPOT LEVEL MAINTNCE	12.00	100.0
230 DIRTY CONTAM SATURAT	11.20	0.1	V CLEAN	7.93	70.8	H POST/THRUFLT	6.57	58.7
			G RPR/RPLT MINOR PARTS	2.00	17.9	R QC CHECK	2.17	19.4
			P REMOVED	1.00	8.9	M PERIODIC/PHASED INSP	1.80	16.1
			X TEST-INSPECT-SERVICE	0.17	1.5	B BEFORE FLT NO ABORT	0.67	6.0
			Z CORROSION REPAIR	0.10	0.9			
007 ARCING, ARCED	9.80	0.1	R REMOVE AND REPLACE	9.00	91.8	M PERIODIC/PHASED INSP	9.00	91.8
			1 BNCH CK-NRTS-NOT ATH	0.80	8.2	H POST/THRUFLT	0.80	8.2
108 BRK/MSG SAFETY WIRE	9.00	0.1	G RPR/RPLT MINOR PARTS	7.00	77.8	H POST/THRUFLT	6.00	66.7
			A BNCH CK AND REPAIRED	2.00	22.2	M PERIODIC/PHASED INSP	3.00	33.3
518 IMPROPER ROUTING	9.00	0.1	G RPR/RPLT MINOR PARTS	7.00	77.8	H POST/THRUFLT	5.00	55.6
			L ADJUST	2.00	22.2	R QC CHECK	4.00	44.4
350 INSULATION BREAKDOWN	8.50	0.1	G RPR/RPLT MINOR PARTS	7.50	88.2	F BETWEEN FLT GND CREW	5.00	58.8
			F REPAIR	1.00	11.8	R QC CHECK	2.00	23.5
						H POST/THRUFLT	1.00	11.8
						M PERIODIC/PHASED INSP	0.50	5.9
615 SHORTED	8.50	0.1	G RPR/RPLT MINOR PARTS	6.50	76.5	D INFLIGHT NO ABORT	6.50	76.5
			R REMOVE AND REPLACE	2.00	23.5	H POST/THRUFLT	2.00	23.5
110 CUT	7.80	0.1	G RPR/RPLT MINOR PARTS	7.10	91.0	F BETWEEN FLT GND CREW	2.60	33.3
			X TEST-INSPECT-SERVICE	0.70	9.0	H POST/THRUFLT	2.00	25.6
						R QC CHECK	2.00	25.6
						M PERIODIC/PHASED INSP	1.20	15.4
169 INCORRECT VOLTAGE	6.00	0.1	R REMOVE AND REPLACE	2.00	33.3	F BETWEEN FLT GND CREW	4.00	66.7
			Y TROUBLESHOOT	2.00	33.3	M PERIODIC/PHASED INSP	2.00	33.3
			L ADJUST	1.50	25.0			
			G RPR/RPLT MINOR PARTS	0.50	8.3			
721 IMPROP RESP-ELEC -IPT	6.00	0.1	R REMOVE AND REPLACE	6.00	100.0	H POST/THRUFLT	6.00	100.0
450 OPEN	5.00	0.1	G RPR/RPLT MINOR PARTS	5.00	100.0	F BETWEEN FLT GND CREW	5.00	100.0
865 PROT COAT/SEALNT DEF	3.17	0.0	G RPR/RPLT MINOR PARTS	2.67	84.2	M PERIODIC/PHASED INSP	3.17	100.0
			X TEST-INSPECT-SERVICE	0.50	15.8			

Figure A-2. KC-135A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

KC/C-135 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 18, 1978 PAGE 21

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	283,930	179,705	$850,348	121,987.68	429.63

1114J PILOT/COPILOT #2 (CONT.) $70,374 LSC/YEAR | PCT OF LSC 8.28 TOTAL | LSC RNK 4 | 8208.81 MAN HRS | PCT OF MHR 6.73 TOTAL | MHR RNK 8 | 28.9114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
812 NO DEF-ASSOC EQP MAL	3.00	0.0	G RPR/RPLT MINOR PARTS	3.00	100.0	F BETWEEN FLT GND CREW	3.00	100.0
150 CHATTERING	2.00	0.0	R REMOVE AND REPLACE	2.00	100.0	H POST/THRUFLT	2.00	100.0
780 BENT,BUCKLED,COLLASP	2.00	0.0	L ADJUST	1.00	50.0	B BEFORE FLT NO ABORT	1.00	50.0
			1 BNCH CK-NRTS-NOT ATM	1.00	50.0	F BETWEEN FLT GND CREW	1.00	50.0
086 IMPROPER HANDLING	0.50	0.0	Y TROUBLESHOOT	0.50	100.0	F BETWEEN FLT GND CREW	0.50	100.0
932 DOES NOT ENGAGE/LOCK	0.50	0.0	G RPR/RPLT MINOR PARTS	0.50	100.0	H POST/THRUFLT	0.30	60.0
						M PERIODIC/PHASED INSP	0.20	40.0

Figure A-2. KC-135A Design/Cost MAMS (Concluded)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 1

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	84,114	$237,509	18,305.37	121.05

11DCT SLIDING WINDOW $46,452 LSC/YEAR | PCT OF LSC 19.56 | LSC RNK 1 | 4991.50 MAN HRS | PCT OF MHR 24.54 | MHR RNK 1 | 29.7029 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	1232.96	27.5	H EQUIP CK NO RPR RQRD	389.38	31.6	F BETWEEN FLT GND CREW	608.01	49.3
			U APLCD AFTER CANBLZTN	230.55	18.7	M PERIODIC/PHASED INSP	520.64	42.2
			T REMOVE FOR CANIBLZTN	222.69	18.1	H POST/THRUFLT	66.81	5.4
			X TEST-INSPECT-SERVICE	200.80	16.3	D INFLIGHT NO ABORT	18.50	1.5
			Q INSTALLED	179.05	14.6	B BEFORE FLT NO ABORT	18.00	1.5
			R REMOVE AND REPLACE	6.00	0.5	B QC CHECK	1.00	0.1
			G RPR/RPLT MINOR PARTS	3.50	0.3			
100 CRACKED	609.14	13.6	R REMOVE AND REPLACE	411.08	67.5	M PERIODIC/PHASED INSP	237.22	38.9
			A BNCH CK AND REPAIRED	87.51	14.4	F BETWEEN FLT GND CREW	174.86	28.7
			9 BNCH CK-CONDENNED	41.17	6.8	H POST/THRUFLT	86.21	14.2
			G RPR/RPLT MINOR PARTS	26.80	4.7	W IN-SHOP REPAIR	53.01	8.7
			P REMOVED	17.57	2.9	D INFLIGHT NO ABORT	35.84	5.9
			Q INSTALLED	14.00	2.3	B BEFORE FLT NO ABORT	14.00	2.3
			I BNCH CK-NRTS-NOT ATM	5.00	0.8	G GROUND ALERT-NOT DGR	7.50	1.2
			F REPAIR	2.00	0.3	A BEFORE FLT ABORT	0.50	0.1
			Y TROUBLESHOOT	2.00	0.3			
105 LOOSE/DMGD BOLTS,NUT	528.98	11.8	G RPR/RPLT MINOR PARTS	510.28	96.5	F BETWEEN FLT GND CREW	225.95	42.7
			L ADJUST	10.00	1.9	M PERIODIC/PHASED INSP	188.86	35.7
			R REMOVE AND REPLACE	6.00	1.1	H POST/THRUFLT	52.14	9.9
			P REMOVED	1.70	0.3	D INFLIGHT NO ABORT	41.50	7.8
			Y TROUBLESHOOT	1.00	0.2	B QC CHECK	8.83	1.7
						W IN-SHOP REPAIR	6.50	1.2
						G GROUND ALERT-NOT DGR	3.50	0.7
						B BEFORE FLT NO ABORT	1.70	0.3
846 DELAMINATED	496.72	11.1	R REMOVE AND REPLACE	307.32	61.9	M PERIODIC/PHASED INSP	358.22	72.1
			A BNCH CK AND REPAIRED	113.00	22.7	F BETWEEN FLT GND CREW	122.51	24.7
			P REMOVED	30.00	6.0	H POST/THRUFLT	9.00	1.8
			G RPR/RPLT MINOR PARTS	23.40	4.7	D INFLIGHT NO ABORT	7.00	1.4
			F REPAIR	11.50	2.3			
			X TEST-INSPECT-SERVICE	4.00	0.8			
			Y TROUBLESHOOT	4.00	0.8			
			9 BNCH CK-CONDENNED	3.50	0.7			
127 ADJMT/ALGNMT IMPROPR	385.70	8.6	L ADJUST	350.70	90.9	F BETWEEN FLT GND CREW	123.04	31.9
			G RPR/RPLT MINOR PARTS	25.00	6.5	M PERIODIC/PHASED INSP	71.22	18.5
			R REMOVE AND REPLACE	8.00	2.1	H POST/THRUFLT	68.31	17.7
			F REPAIR	2.00	0.5	D INFLIGHT NO ABORT	55.92	14.5
						J PREFLIGHT	22.50	5.8
						B BEFORE FLT NO ABORT	21.80	5.7
						G GROUND ALERT-NOT DGR	15.50	4.0
						A QC CHECK	5.00	1.3
						S DEPOT LEVEL MAINTNCE	2.40	0.6
070 BROKEN	216.62	4.8	R REMOVE AND REPLACE	130.83	60.4	M PERIODIC/PHASED INSP	87.61	40.4

Figure A-3. B-52G/H Design/Cost MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 2

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11OCT SLIDING WINDOW (CONT.)	$46,452 LSC/YEAR	PCT OF LSC 19.56	LSC RNK 1	4491.50 MAN HRS	PCT OF MHR 24.54 TOTAL	MHR RNK 1	29.7029 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
			G RPR/RPLT MINOR PARTS	60.91	28.1	F BETWEEN FLT GND CREW	77.46	35.8
			9 BNCH CK-CONDENNED	5.36	2.5	H POST/THRUFLT	33.30	15.4
			A BNCH CK AND REPAIRED	5.00	2.3	D INFLIGHT NO ABORT	9.25	4.3
			X TEST-INSPECT-SERVICE	5.00	2.3	A BEFORE FLT ABORT	6.00	2.8
			Q INSTALLED	4.00	1.8	J PREFLIGHT	2.00	0.9
			Y TROUBLESHOOT	3.00	1.4	Q GROUND ALERT-NOT DOR	0.50	0.2
			P REMOVED	2.00	0.9	W IN-SHOP REPAIR	0.50	0.2
			I BNCH CK-NBTS-NOT ATH	0.50	0.2			
010 CHIPPED	200.28	4.5	R REMOVE AND REPLACE	151.78	75.8	M PERIODIC/PHASED INSP	105.88	52.9
			P REMOVED	24.00	12.0	F BETWEEN FLT GND CREW	57.40	28.7
			9 BNCH CK-CONDENNED	12.50	6.2	B BEFORE FLT NO ABORT	19.00	9.5
			A BNCH CK AND REPAIRED	7.00	3.5	D INFLIGHT NO ABORT	10.00	5.0
			Y TROUBLESHOOT	5.00	2.5	H POST/THRUFLT	8.00	4.0
020 WORN CHAFED OR FRAYD	90.31	2.0	G RPR/RPLT MINOR PARTS	37.91	42.0	F BETWEEN FLT GND CREW	45.01	49.8
			R REMOVE AND REPLACE	20.00	22.1	M PERIODIC/PHASED INSP	29.30	32.4
			F REPAIR	15.90	17.6	W IN-SHOP REPAIR	5.00	5.5
			A BNCH CK AND REPAIRED	12.50	13.8	D INFLIGHT NO ABORT	4.00	4.4
			P REMOVED	3.00	3.3	B BEFORE FLT NO ABORT	3.00	3.3
			9 BNCH CK-CONDENNED	1.00	1.1	C INFLIGHT ABOR:	2.00	2.2
						H POST/THRUFLT	2.00	2.2
100 MISSING BOLTS,NUTS..	71.87	1.6	G RPR/RPLT MINOR PARTS	67.17	93.5	F BETWEEN FLT GND CREW	37.00	51.5
			Y TROUBLESHOOT	3.70	5.1	M PERIODIC/PHASED INSP	21.67	30.2
			Q INSTALLED	1.00	1.4	R QC CHECK	8.20	11.4
						S DEPOT LEVEL MAINTNCE	4.00	5.6
						D INFLIGHT NO ABORT	1.00	1.4
800 NO DEF-RMVD-OTH MAINT	65.79	1.5	Q INSTALLED	29.25	44.5	F BETWEEN FLT GND CREW	38.10	57.9
			P REMOVED	23.10	35.1	H POST/THRUFLT	17.50	26.6
			G RPR/RPLT MINOR PARTS	6.30	9.6	M PERIODIC/PHASED INSP	8.18	12.4
			S REMOVE AND REINSTALL	5.50	8.4	J PREFLIGHT	2.00	3.0
			X TEST-INSPECT-SERVICE	0.83	1.3			
			R REMOVE AND REPLACE	0.80	1.2			
947 TORN	65.01	1.4	R REMOVE AND REPLACE	45.01	69.2	D INFLIGHT NO ABORT	20.00	30.8
			G RPR/RPLT MINOR PARTS	18.50	28.5	F BETWEEN FLT GND CREW	19.00	29.2
			X TEST-INSPECT-SERVICE	1.00	1.5	H POST/THRUFLT	12.50	19.2
			A BNCH CK AND REPAIRED	0.50	0.8	M PERIODIC/PHASED INSP	11.00	16.9
						J PREFLIGHT	2.00	3.1
						W IN-SHOP REPAIR	0.50	0.8
117 DETERIORATED	61.51	1.4	R REMOVE AND REPLACE	33.90	55.1	H POST/THRUFLT	22.00	35.8
			G RPR/RPLT MINOR PARTS	27.60	44.9	F BETWEEN FLT GND CREW	17.70	28.8
						M PERIODIC/PHASED INSP	13.20	21.5
						D INFLIGHT NO ABORT	6.30	10.2
						R QC CHECK	2.00	3.3

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 3

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DCT SLIDING WINDOW (CONT.)	$46,452 LSC/YEAR	PCT OF LSC 19.56 TOTAL	LSC RNK 1	4491.50 MAN HRS	PCT OF MHR 24.54 TOTAL	MHR RNK 1	29.7029 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						S DEPOT LEVEL MAINTNCE	0.30	0.5
135 BINDING,STUCK,JAMMED	50.50	1.1	L ADJUST	37.50	74.3	S DEPOT LEVEL MAINTNCE	37.20	73.7
			R REMOVE AND REPLACE	6.00	11.9	F BETWEEN FLT GND CREW	10.00	19.8
			G RPR/RPLT MINOR PARTS	4.00	7.9	J PREFLIGHT	2.00	4.0
			V CLEAN	2.00	4.0	B BEFORE FLT NO ABORT	1.00	2.0
			Y TROUBLESHOOT	1.00	2.0	M PERIODIC/PHASED INSP	0.30	0.6
381 LEAKING INT OR EXT	45.40	1.0	G RPR/RPLT MINOR PARTS	26.24	57.8	H POST/THRUFLT	16.67	36.7
			R REMOVE AND REPLACE	14.17	31.2	F BETWEEN FLT GND CREW	13.13	28.9
			Y TROUBLESHOOT	5.00	11.0	D INFLIGHT NO ABORT	12.00	26.4
						J PREFLIGHT	2.50	5.5
						S DEPOT LEVEL MAINTNCE	1.10	2.4
805 NO DEF-NOC-OTH MAINT	40.47	0.9	G RPR/RPLT MINOR PARTS	33.10	81.8	F BETWEEN FLT GND CREW	26.97	66.6
			Q INSTALLED	6.37	15.7	M PERIODIC/PHASED INSP	13.50	33.4
			S REMOVE AND REINSTALL	1.00	2.5			
230 DIRTY CONTAM SATURAT	35.50	0.8	V CLEAN	35.50	100.0	M PERIODIC/PHASED INSP	25.10	70.7
						H POST/THRUFLT	6.90	19.4
						F BETWEEN FLT GND CREW	3.50	9.9
160 CONTACTS/CONN DEFECT	33.99	0.8	G RPR/RPLT MINOR PARTS	30.99	91.2	F BETWEEN FLT GND CREW	23.59	69.4
			R REMOVE AND REPLACE	3.00	8.8	M PERIODIC/PHASED INSP	8.40	24.7
						B BEFORE FLT NO ABORT	2.00	5.9
116 CUT	33.34	0.7	R REMOVE AND REPLACE	20.84	62.5	H POST/THRUFLT	15.00	45.0
			P REMOVED	12.50	37.5	W IN-SHOP REPAIR	10.50	31.5
						D INFLIGHT NO ABORT	3.83	11.5
						F BETWEEN FLT GND CREW	2.00	6.0
						M PERIODIC/PHASED INSP	2.00	6.0
469 BUSHING WORN/DAMAGED	31.00	0.7	G RPR/RPLT MINOR PARTS	22.00	71.0	H POST/THRUFLT	18.00	58.1
			A BNCH CK AND REPAIRED	9.00	29.0	F BETWEEN FLT GND CREW	9.00	29.0
						S DEPOT LEVEL MAINTNCE	4.00	12.9
374 INTERNAL FAILURE	28.67	0.6	R REMOVE AND REPLACE	24.00	83.7	M PERIODIC/PHASED INSP	14.00	48.8
			Y TROUBLESHOOT	4.00	14.0	D INFLIGHT NO ABORT	10.00	34.9
			9 BNCH CK-CONDENNED	0.67	2.3	B BEFORE FLT NO ABORT	4.00	14.0
						F BETWEEN FLT GND CREW	0.67	2.3
780 BENT,BUCKLED,COLLASP	26.80	0.6	R REMOVE AND REPLACE	9.50	35.4	F BETWEEN FLT GND CREW	12.50	46.6
			A BNCH CK AND REPAIRED	8.00	29.9	M PERIODIC/PHASED INSP	4.30	16.0
			G RPR/RPLT MINOR PARTS	4.30	16.0	B BEFORE FLT NO ABORT	4.00	14.9
			L ADJUST	4.00	14.9	R QC CHECK	4.00	14.9
			9 BNCH CK-CONDENNED	1.00	3.7	H POST/THRUFLT	2.00	7.5
730 LOOSE	26.04	0.6	G RPR/RPLT MINOR PARTS	8.00	30.7	B BEFORE FLT NO ABORT	8.00	30.7

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 4

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DCT SLIDING WINDOW (CONT.)	$48,452	LSC/YEAR	PCT OF LSC 19.56	TOTAL	LSC RNK 1	4491.50 MAN HRS	PCT OF MHR 24.54	TOTAL	MHR RNK 1	29.7029 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			P REMOVED	8.00	30.7	H POST/THRUFLT	7.00	26.9
			L ADJUST	7.33	28.1	M PERIODIC/PHASED INSP	4.33	16.6
			A BNCH CK AND REPAIRED	2.70	10.4	F BETWEEN FLT GND CREW	4.00	15.4
						W IN-SHOP REPAIR	2.70	10.4
900 BURNED OR OVERHEATED	16.00	0.4	P REMOVED	9.00	56.3	H POST/THRUFLT	9.00	56.3
			R REMOVE AND REPLACE	4.80	30.0	D INFLIGHT NO ABORT	7.00	43.8
			9 BNCH CK-CONDENNED	2.20	13.7			
242 FAILED TO OPERATE	15.92	0.4	Y TROUBLESHOOT	13.00	81.7	F BETWEEN FLT GND CREW	8.42	52.9
			G RPR/RPLT MINOR PARTS	2.92	18.3	M PERIODIC/PHASED INSP	3.50	22.0
						D INFLIGHT NO ABORT	2.00	12.6
						J PREFLIGHT	2.00	12.6
935 SCORED OR SCRATCHED	9.80	0.2	R REMOVE AND REPLACE	6.00	61.2	M PERIODIC/PHASED INSP	9.80	100.0
			A BNCH CK AND REPAIRED	3.80	38.8			
865 PROT COAT/SEALNT DEF	9.10	0.2	Q INSTALLED	5.00	54.9	F BETWEEN FLT GND CREW	5.00	54.9
			G RPR/RPLT MINOR PARTS	4.10	45.1	D INFLIGHT NO ABORT	4.00	44.0
						S DEPOT LEVEL MAINTNCE	0.10	1.1
240 IMPROP/FAULTY MAINT	9.00	0.2	R REMOVE AND REPLACE	7.00	77.8	G GROUND ALERT-NOT DGR	4.00	44.4
			G RPR/RPLT MINOR PARTS	2.00	22.2	F BETWEEN FLT GND CREW	3.00	33.3
						M PERIODIC/PHASED INSP	2.00	22.2
750 MISSING	8.70	0.2	Q INSTALLED	4.00	46.0	F BETWEEN FLT GND CREW	4.70	54.0
			R REMOVE AND REPLACE	3.00	34.5	M PERIODIC/PHASED INSP	4.00	46.0
			G RPR/RPLT MINOR PARTS	1.70	19.5			
084 LEAD BROKEN	8.30	0.2	G RPR/RPLT MINOR PARTS	8.30	100.0	D INFLIGHT NO ABORT	5.30	63.9
						F BETWEEN FLT GND CREW	3.00	36.1
812 NO DEF-ASSOC EQP MAL	8.00	0.2	H EQUIP CK NO RPR RQRD	4.00	50.0	D INFLIGHT NO ABORT	4.00	50.0
			Y TROUBLESHOOT	4.00	50.0	F BETWEEN FLT GND CREW	2.00	25.0
						H POST/THRUFLT	2.00	25.0
350 INSULATION BREAKDOWN	5.30	0.1	G RPR/RPLT MINOR PARTS	5.30	100.0	M PERIODIC/PHASED INSP	5.30	100.0
605 CRAZED	4.50	0.1	P REMOVED	4.00	88.9	F BETWEEN FLT GND CREW	4.50	100.0
			9 BNCH CK-CONDENNED	0.50	11.1			
585 SHEARED	4.00	0.1	R REMOVE AND REPLACE	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0
932 DOES NOT ENGAGE/LOCK	3.00	0.1	Y TROUBLESHOOT	3.00	100.0	H POST/THRUFLT	3.00	100.0
609 OUT OF TRACK	2.83	0.1	L ADJUST	2.83	100.0	F BETWEEN FLT GND CREW	2.83	100.0
472 FUSE/CKT PROT DEFECT	2.17	0.0	G RPR/RPLT MINOR PARTS	2.17	100.0	D INFLIGHT NO ABORT	2.17	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 5

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DCT SLIDING WINDOW (CONT.)	$46,452	LSC/ YEAR	PCT OF LSC 19.56	TOTAL	LSC RNK 1	4491.50	MAN HRS	PCT OF MHR 24.54	TOTAL	MHR RNK 1	29.7029	MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
007 ARCING, ARCED	2.00	0.0	A BNCH CK AND REPAIRED	2.00	100.0	M PERIODIC/PHASED INSP	2.00	100.0
080 DEFECTIVE LAMP/METER	2.00	0.0	G RPR/RPLT MINOR PARTS	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
804 NO DEF-SCH MAINT/MOD	2.00	0.0	P REMOVED	2.00	100.0	M PERIODIC/PHASED INSP	2.00	100.0
710 BEARING FAILURE	1.00	0.0	R REMOVE AND REPLACE	1.00	100.0	H POST/THRUFLT	1.00	100.0
078 WEATHER DAMAGE	1.00	0.0	R REMOVE AND REPLACE	1.00	100.0	H POST/THRUFLT	1.00	100.0
719 BRK/FRYED BND/GND WR	0.30	0.0	G RPR/RPLT MINOR PARTS	0.30	100.0	M PERIODIC/PHASED INSP	0.30	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR 13, 1978 PAGE 6

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DCR W/S NO 2 L AND RT	$36,186 LSC/YEAR	PCT OF LSC 15.24	TOTAL	LSC RNK 2	2555.30 MAN HRS	PCT OF MHR 13.96	TOTAL	MHR RNK 3	18.8986 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MA.
799 NO DEFECT	748.75	29.3	H EQUIP CK NO RPR RQRD	355.12	47.4	M PERIODIC/PHASED INSP	505.00	67.4
			X TEST-INSPECT-SERVICE	186.77	24.9	F BETWEEN FLT GND CREW	124.27	16.6
			Q INSTALLED	165.94	22.2	D INFLIGHT NO ABORT	42.50	5.7
			U RPLCD AFTER CANBLZTN	28.00	3.7	H POST/THRUFLT	41.34	5.5
			T REMOVE FOR CANIBLZTN	8.00	1.1	B BEFORE FLT NO ABORT	14.00	1.9
			R REMOVE AND REPLACE	4.00	0.5	N GROUNT ALERT-DEGRAD	9.34	1.2
			G RPR/RPLT MINOR PARTS	0.92	0.1	J PREFLIGHT	8.00	1.1
						A BEFORE FLT ABORT	4.00	0.5
						R QC CHECK	0.30	0.0
190 CRACKED	452.24	17.7	R REMOVE AND REPLACE	360.05	79.6	F BETWEEN FLT GND CREW	162.49	35.9
			P REMOVED	52.92	11.7	M PERIODIC/PHASED INSP	132.24	29.2
			9 BNCH CK-CONDENNED	14.43	3.2	D INFLIGHT NO ABORT	87.67	19.4
			A BNCH CK AND REPAIRED	11.00	2.4	A BEFORE FLT ABORT	30.00	6.6
			Q INSTALLED	7.67	1.7	H POST/THRUFLT	23.00	5.1
			G RPR/RPLT MINOR PARTS	5.17	1.1	W IN-SHOP REPAIR	11.00	2.4
			Y TROUBLESHOOT	1.00	0.2	J PREFLIGHT	5.83	1.3
846 DELAMINATED	382.87	15.0	R REMOVE AND REPLACE	300.78	78.6	M PERIODIC/PHASED INSP	211.85	55.3
			P REMOVED	67.50	17.6	F BETWEEN FLT GND CREW	103.51	27.0
			9 BNCH CK-CONDENNED	8.67	2.3	D INFLIGHT NO ABORT	48.51	12.7
			Y TROUBLESHOOT	4.00	1.0	G GROUND ALERT-NOT DGR	10.00	2.6
			X TEST-INSPECT-SERVICE	1.92	0.5	H POST/THRUFLT	9.00	2.4
105 LOOSE/DMGD BOLTS,NUT	314.54	12.3	G RPR/RPLT MINOR PARTS	304.04	96.7	M PERIODIC/PHASED INSP	240.48	76.5
			L ADJUST	10.50	3.3	F BETWEEN FLT GND CREW	46.92	14.9
						D INFLIGHT NO ABORT	10.00	3.2
						H POST/THRUFLT	8.63	2.7
						R QC CHECK	4.50	1.4
						G GROUND ALERT-NOT DGR	4.09	1.3
242 FAILED TO OPERATE	87.56	3.4	R REMOVE AND REPLACE	44.25	50.5	D INFLIGHT NO ABORT	39.75	45.4
			Y TROUBLESHOOT	29.80	34.0	F BETWEEN FLT GND CREW	27.30	31.2
			P REMOVED	13.50	15.4	B BEFORE FLT NO ABORT	12.50	14.3
						H POST/THRUFLT	8.00	9.1
127 ADJMT/ALGNMT IMPROPR	58.34	2.3	L ADJUST	57.84	99.1	M PERIODIC/PHASED INSP	49.84	85.4
			G RPR/RPLT MINOR PARTS	0.50	0.9	F BETWEEN FLT GND CREW	6.00	10.3
						D INFLIGHT NO ABORT	2.00	3.4
						H POST/THRUFLT	0.50	0.9
070 BROKEN	56.84	2.2	R REMOVE AND REPLACE	33.67	59.2	F BETWEEN FLT GND CREW	22.00	38.7
			G RPR/RPLT MINOR PARTS	16.00	28.1	D INFLIGHT NO ABORT	12.00	21.1
			P REMOVED	6.67	11.7	H POST/THRUFLT	9.00	15.8
			Q INSTALLED	0.50	0.9	N GROUNT ALERT-DEGRAD	6.67	11.7
						M PERIODIC/PHASED INSP	4.50	7.9
						B BEFORE FLT NO ABORT	2.00	3.5

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 7

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DCR W/S NO 2 L AND AT (CONT.)	$36,186 LSC/YEAR	PCT OF LSC 15.24 TOTAL	LSC RNK 2	2555.30 MAN HRS	PCT OF MHR 13.96 TOTAL	WHR RNK 3	16.8986 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						G GROUND ALERT-NOT DGR	0.67	1.2
805 NO DEF-NOC-OTH MAINT	51.55	2.9	G RPR/RPLT MINOR PARTS	33.60	65.2	F BETWEEN FLT GND CREW	34.75	67.4
			Q INSTALLED	11.75	22.8	M PERIODIC/PHASED INSP	15.60	30.3
			S REMOVE AND REINSTALL	6.20	12.0	D INFLIGHT NO ABORT	1.20	2.3
108 MISSING BOLTS,NUTS,	48.31	1.9	G RPR/RPLT MINOR PARTS	40.24	83.3	M PERIODIC/PHASED INSP	29.40	60.9
			A BNCH CK AND REPAIRED	6.90	14.3	F BETWEEN FLT GND CREW	12.90	26.7
			Q INSTALLED	1.17	2.4	D INFLIGHT NO ABORT	6.00	12.4
374 INTERNAL FAILURE	39.09	1.5	R REMOVE AND REPLACE	38.50	98.5	F BETWEEN FLT GND CREW	14.00	35.8
			9 BNCH CK-CONDENNED	0.58	1.5	D INFLIGHT NO ABORT	13.00	33.3
						M PERIODIC/PHASED INSP	12.08	30.9
865 PROT COAT/SEALNT DEF	38.87	1.5	G RPR/RPLT MINOR PARTS	38.87	100.0	M PERIODIC/PHASED INSP	37.87	97.4
						H POST/THRUFLT	1.00	2.6
900 BURNED OR OVERHEATED	35.80	1.4	R REMOVE AND REPLACE	33.50	93.6	M PERIODIC/PHASED INSP	29.00	81.0
			G RPR/RPLT MINOR PARTS	1.30	3.6	F BETWEEN FLT GND CREW	5.50	15.4
			9 BNCH CK-CONDENNED	1.00	2.8	D INFLIGHT NO ABORT	1.30	3.6
800 NO DEF-RMVD-OTH MAINT	30.50	1.2	Q INSTALLED	23.50	77.0	F BETWEEN FLT GND CREW	17.00	55.7
			G RPR/RPLT MINOR PARTS	4.00	13.1	D INFLIGHT NO ABORT	10.50	34.4
			S REMOVE AND REINSTALL	3.00	9.8	M PERIODIC/PHASED INSP	3.00	9.8
117 DETERIORATED	23.60	0.9	G RPR/RPLT MINOR PARTS	12.10	51.3	M PERIODIC/PHASED INSP	15.10	64.0
			R REMOVE AND REPLACE	11.50	48.7	H POST/THRUFLT	5.00	21.2
						R QC CHECK	3.00	12.7
						S DEPOT LEVEL MAINTNCE	0.50	2.1
730 LOOSE	22.37	0.9	L ADJUST	13.33	59.6	M PERIODIC/PHASED INSP	20.37	91.1
			G RPR/RPLT MINOR PARTS	8.53	38.1	F BETWEEN FLT GND CREW	2.00	8.9
			R REMOVE AND REPLACE	0.50	2.2			
160 CONTACTS/CONN DEFECT	21.97	0.9	G RPR/RPLT MINOR PARTS	12.97	59.0	D INFLIGHT NO ABORT	10.00	45.5
			P REMOVED	5.00	22.8	F BETWEEN FLT GND CREW	4.80	21.8
			L ADJUST	4.00	18.2	J PREFLIGHT	4.17	19.0
						G GROUND ALERT-NOT DGR	3.00	13.7
935 SCORED OR SCRATCHED	19.00	0.7	R REMOVE AND REPLACE	19.00	100.0	D INFLIGHT NO ABORT	16.00	84.2
						M PERIODIC/PHASED INSP	3.00	15.8
910 CHIPPED	16.80	0.7	R REMOVE AND REPLACE	13.00	77.4	M PERIODIC/PHASED INSP	16.80	100.0
			P REMOVED	3.00	17.9			
			Y TROUBLESHOOT	0.80	4.8			
334 TEMPERATURE INCORR	16.00	0.6	R REMOVE AND REPLACE	16.00	100.0	D INFLIGHT NO ABORT	16.00	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

[illegible] WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 8

FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
151.214	54,114	$237,509	18,305.37	121.05

[illegible] W/S NO 2 L AND RT (CONT.) $36,186 LSC/YEAR PCT OF LSC 15.24 TOTAL LSC RNK 2 2555.30 MAN HRS PCT OF MHR 13.96 TOTAL MHR RNK 3 16.8986 MANHR /1000 FLT HR

MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
997 TURN	15.15	0.6	R REMOVE AND REPLACE	8.00	52.8	D INFLIGHT NO, ABORT	8.00	52.8
			G RPR/RPLT MINOR PARTS	7.15	47.2	M PERIODIC/PHASED INSP	4.40	29.0
						H POST/THRUFLT	2.00	13.2
						F BETWEEN FLT GND CREW	0.75	5.0
830 DIRTY CONTAM SATURAT	12.00	0.8	V CLEAN	12.00	100.0	M PERIODIC/PHASED INSP	4.50	37.5
						D INFLIGHT NO ABORT	3.20	26.7
						H POST/THRUFLT	2.80	23.3
						R QC CHECK	0.80	6.7
						J PREFLIGHT	0.70	5.8
381 LEAKING INT OR EXT	11.50	0.5	L ADJUST	10.00	87.0	F BETWEEN FLT GND CREW	10.00	87.0
			G RPR/RPLT MINOR PARTS	1.50	13.0	S DEPOT LEVEL MAINTNCE	1.50	13.0
884 LEAD BROKEN	8.83	0.3	G RPR/RPLT MINOR PARTS	8.83	100.0	F BETWEEN FLT GND CREW	5.00	56.6
						D INFLIGHT NO ABORT	3.83	43.4
007 ARCING, ARCED	8.00	0.3	R REMOVE AND REPLACE	8.00	100.0	M PERIODIC/PHASED INSP	8.00	100.0
246 IMPROP/FAULTY MAINT	7.00	0.3	G RPR/RPLT MINOR PARTS	7.00	100.0	M PERIODIC/PHASED INSP	7.00	100.0
750 MISSING	7.00	0.3	G RPR/RPLT MINOR PARTS	7.00	100.0	F BETWEEN FLT GND CREW	5.00	71.4
						M PERIODIC/PHASED INSP	2.00	28.6
150 CHATTERING	4.00	0.2	9 BNCH CK-CONDENNED	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0
615 SHORTED	3.20	0.1	Y TROUBLESHOOT	2.00	62.5	F BETWEEN FLT GND CREW	3.20	100.0
			R REMOVE AND REPLACE	1.20	37.5			
472 FUSE/CKT PROT DEFECT	3.00	0.2	G RPR/RPLT MINOR PARTS	3.00	100.0	B BEFORE FLT NO ABORT	2.00	66.7
						F BETWEEN FLT GND CREW	1.00	33.3
660 STRIPPED	2.80	0.1	G RPR/RPLT MINOR PARTS	2.80	100.0	F BETWEEN FLT GND CREW	2.80	100.0
020 WORN CHAFED OR FRAYD	2.00	0.1	R REMOVE AND REPLACE	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
135 BINDING,STUCK,JAMMED	2.00	0.1	L ADJUST	2.00	100.0	M PERIODIC/PHASED INSP	2.00	100.0
032 DOES NOT ENGAGE/LOCK	1.50	0.1	L ADJUST	1.50	100.0	U NON-DESTRUCTIVE INSP	1.50	100.0
080 DEFECTIVE LAMP/METER	1.00	0.0	G RPR/RPLT MINOR PARTS	1.00	100.0	D INFLIGHT NO ABORT	1.00	100.0
812 NO DEF-ASSOC EQP MAL	0.92	0.0	G RPR/RPLT MINOR PARTS	0.92	100.0	M PERIODIC/PHASED INSP	0.92	100.0
303 BIRD STRIKE DAMAGE	0.30	0.0	V CLEAN	0.30	100.0	H POST/THRUFLT	0.30	100.0
003 NO DEF-TIME CHANGE	0.10	0.0	R REMOVE AND REPLACE	0.10	100.0	S DEPOT LEVEL MAINTNCE	0.10	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS DNAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 9

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

41HAB W/S ANTICE TEMP CONT $24,576 LSC/YEAR | PCT OF LSC 10.35 TOTAL | LSC RNK 3 | 704.81 MAN HRS | PCT OF MHR 3.85 TOTAL | MHR RNK 8 | 4.6597 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF NUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	246.07	35.0	U RPLCD AFTER CANBLZTN	96.18	39.0	F BETWEEN FLT GND CREW	229.70	93.0
			T REMOVE FOR CANIBLZTN	76.51	31.0	M PERIODIC/PHASED INSP	9.67	3.9
			X TEST-INSPECT-SERVICE	49.18	19.9	D INFLIGHT NO ABORT	6.50	2.6
			Q INSTALLED	9.00	3.6	Y RECEIPT FROM STOCK	1.00	0.4
			B BNCH CK-NO RPR RQRD	6.00	2.4			
			H EQUIP CK NO RPR RQRD	6.00	2.4			
			P REMOVED	4.00	1.6			
374 INTERNAL FAILURE	231.97	32.9	R REMOVE AND REPLACE	150.36	64.8	F BETWEEN FLT GND CREW	153.29	66.1
			1 BNCH CK-NRTS-NOT ATH	57.78	24.9	D INFLIGHT NO ABORT	53.18	22.9
			G RPR/RPLT MINOR PARTS	17.84	7.7	G GROUND ALERT-NOT DGR	10.50	4.5
			Y TROUBLESHOOT	4.00	1.7	B BEFORE FLT NO ABORT	7.50	3.2
			P REMOVED	2.00	0.9	H POST/THRUFLT	7.00	3.0
						L TRAINING OR MAINTNCE	0.50	0.2
242 FAILED TO OPERATE	39.74	5.6	R REMOVE AND REPLACE	21.40	53.9	F BETWEEN FLT GND CREW	29.34	73.8
			Y TROUBLESHOOT	16.34	41.1	S DEPOT LEVEL MAINTNCE	5.40	13.6
			G RPR/RPLT MINOR PARTS	2.00	5.0	D INFLIGHT NO ABORT	5.00	12.6
805 NO DEF-NOC-OTH MAINT	31.34	4.4	G RPR/RPLT MINOR PARTS	16.34	52.1	F BETWEEN FLT GND CREW	31.00	98.9
			S REMOVE AND REINSTALL	7.00	22.3	M PERIODIC/PHASED INSP	0.33	1.1
			Q INSTALLED	4.00	12.8			
			X TEST-INSPECT-SERVICE	4.00	12.8			
160 CONTACTS/CONN DEFECT	24.42	3.5	G RPR/RPLT MINOR PARTS	11.50	47.1	F BETWEEN FLT GND CREW	13.50	55.3
			1 BNCH CK-NRTS-NOT ATH	5.75	23.5	D INFLIGHT NO ABORT	8.92	36.5
			R REMOVE AND REPLACE	4.00	16.4	H POST/THRUFLT	2.00	8.2
			X TEST-INSPECT-SERVICE	2.00	8.2			
			L ADJUST	1.17	4.8			
472 FUSE/CKT PROT DEFECT	23.34	3.3	G RPR/RPLT MINOR PARTS	23.34	100.0	D INFLIGHT NO ABORT	11.84	50.7
						F BETWEEN FLT GND CREW	11.50	49.3
105 LOOSE/DMGD BOLTS,NUT	21.50	3.1	G RPR/RPLT MINOR PARTS	21.50	100.0	F BETWEEN FLT GND CREW	11.84	55.1
						M PERIODIC/PHASED INSP	5.67	26.4
						D INFLIGHT NO ABORT	3.00	14.0
						H POST/THRUFLT	1.00	4.7
809 NO DEF-RMVD-OTH MAINT	12.67	1.8	G RPR/RPLT MINOR PARTS	8.67	68.4	F BETWEEN FLT GND CREW	12.00	94.7
			S REMOVE AND REINSTALL	3.00	23.7	M PERIODIC/PHASED INSP	0.67	5.3
			V CLEAN	1.00	7.9			
127 ADJMT/ALGNMT IMPROPR	9.84	1.4	L ADJUST	5.83	59.2	F BETWEEN FLT GND CREW	8.84	89.8
			A BNCH CK AND REPAIRED	4.00	40.7	D INFLIGHT NO ABORT	1.00	10.2
020 WORN CHAFED OR FRAYD	9.34	1.3	G RPR/RPLT MINOR PARTS	5.33	57.1	M PERIODIC/PHASED INSP	5.33	57.1
			1 BNCH CK-NRTS-NOT ATH	4.00	42.8	F BETWEEN FLT GND CREW	4.00	42.8

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 10

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

41 HAB W/S ANTICE TEMP CONT (CONT.) $24,576 LSC/YEAR | PCT OF LSC 10.35 TOTAL | LSC RNK 3 | 704.61 MAN HRS | PCT OF MHR 3.85 TOTAL | MHR RNK 8 | 4.6597 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
450 OPEN	9.00	1.3	Y TROUBLESHOOT	4.00	44.4	F BETWEEN FLT GND CREW	5.00	55.6
			1 BNCH CK-NRTS-NOT ATH	3.00	33.3	D INFLIGHT NO ABORT	4.00	44.4
			R REMOVE AND REPLACE	2.00	22.2			
884 LEAD BROKEN	8.17	1.2	G RPR/RPLT MINOR PARTS	8.17	100.0	F BETWEEN FLT GND CREW	5.00	61.2
						G GROUND ALERT-NOT DGR	1.67	20.4
						M PERIODIC/PHASED INSP	1.50	18.4
815 SHORTED	7.25	1.0	1 BNCH CK-NRTS-NOT ATH	6.25	86.2	F BETWEEN FLT GND CREW	3.25	44.8
			G RPR/RPLT MINOR PARTS	1.00	13.8	W IN-SHOP REPAIR	3.00	41.4
						B BEFORE FLT NO ABORT	1.00	13.8
070 BROKEN	5.00	0.7	G RPR/RPLT MINOR PARTS	5.00	100.0	F BETWEEN FLT GND CREW	5.00	100.0
169 INCORRECT VOLTAGE	5.00	0.7	R REMOVE AND REPLACE	2.50	50.0	D INFLIGHT NO ABORT	3.00	60.0
			1 BNCH CK-NRTS-NOT ATH	2.00	40.0	F BETWEEN FLT GND CREW	1.00	20.0
			G RPR/RPLT MINOR PARTS	0.50	10.0	G GROUND ALERT-NOT DGR	1.00	20.0
118 CUT	4.00	0.6	F REPAIR	4.00	100.0	P FUNCTIONAL CK FLT	4.00	100.0
901 INTERMITTENT	3.50	0.5	R REMOVE AND REPLACE	3.50	100.0	D INFLIGHT NO ABORT	3.50	100.0
255 NO/INCORRECT OUTPUT	2.83	0.4	1 BNCH CK-NRTS-NOT ATH	2.83	100.0	N GROUNT ALERT-DEGRAD	2.83	100.0
750 MISSING	2.67	0.4	G RPR/RPLT MINOR PARTS	2.67	100.0	F BETWEEN FLT GND CREW	2.67	100.0
106 MISSING BOLTS,NUTS..	2.17	0.3	G RPR/RPLT MINOR PARTS	2.17	100.0	D INFLIGHT NO ABORT	1.83	84.3
						M PERIODIC/PHASED INSP	0.33	15.2
719 BRK/FRYED BND/GND WR	2.00	0.3	G RPR/RPLT MINOR PARTS	2.00	100.0	M PERIODIC/PHASED INSP	2.00	100.0
730 LOOSE	1.00	0.1	G RPR/RPLT MINOR PARTS	1.00	100.0	F BETWEEN FLT GND CREW	1.00	100.0
780 BENT,BUCKLED,COLLASP	1.00	0.1	A BNCH CK AND REPAIRED	1.00	100.0	F BETWEEN FLT GND CREW	1.00	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 11

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC7 WINDOW NO 4 L AND RT $23,028 LSC/YEAR | PCT OF LSC 9.70 TOTAL | LSC RNK 4 | 2174.84 MAN HRS | PCT OF MHR 11.88 TOTAL | MHR RNK 6 | 14.3825 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	665.10	30.6	H EQUIP CK NO RPR RQRD	377.48	56.8	M PERIODIC/PHASED INSP	576.90	86.7
			X TEST-INSPECT-SERVICE	207.29	31.2	F BETWEEN FLT GND CREW	59.04	8.9
			Q INSTALLED	59.34	8.9	H POST/THRUFLT	22.17	3.3
			R REMOVE AND REPLACE	12.00	1.8	D INFLIGHT NO ABORT	4.00	0.6
			T REMOVE FOR CANIBLZTN	6.00	0.9	C INFLIGHT ABORT	1.50	0.2
			U RPLCD AFTER CANBLZTN	2.00	0.3	Q GROUND ALERT-NOT DGR	1.50	0.2
			G RPR/RPLT MINOR PARTS	1.90	0.2			
846 DELAMINATED	396.10	18.2	R REMOVE AND REPLACE	355.03	89.6	M PERIODIC/PHASED INSP	268.15	67.7
			P REMOVED	26.00	6.6	F BETWEEN FLT GND CREW	73.00	18.4
			Y TROUBLESHOOT	10.00	2.5	H POST/THRUFLT	29.00	7.3
			X TEST-INSPECT-SERVICE	2.73	0.7	D INFLIGHT NO ABORT	26.00	6.6
			9 BNCH CK-CONDENNED	2.00	0.5			
			G RPR/RPLT MINOR PARTS	0.40	0.1			
105 LOOSE/DMGD BOLTS,NUT	341.39	15.7	G RPR/RPLT MINOR PARTS	325.39	95.3	M PERIODIC/PHASED INSP	298.58	87.5
			L ADJUST	13.00	3.8	R QC CHECK	14.30	4.2
			Y TROUBLESHOOT	2.00	0.6	F BETWEEN FLT GND CREW	12.50	3.7
			F REPAIR	1.00	0.3	H POST/THRUFLT	12.00	3.5
						D INFLIGHT NO ABORT	4.00	1.2
190 CRACKED	194.68	9.0	R REMOVE AND REPLACE	143.01	73.5	F BETWEEN FLT GND CREW	80.17	41.2
			G RPR/RPLT MINOR PARTS	34.00	17.5	M PERIODIC/PHASED INSP	77.51	39.8
			P REMOVED	9.17	4.7	D INFLIGHT NO ABORT	23.00	11.8
			9 BNCH CK-CONDENNED	8.50	4.4	H POST/THRUFLT	14.00	7.2
900 BURNED OR OVERHEATED	98.26	4.5	R REMOVE AND REPLACE	76.25	77.6	M PERIODIC/PHASED INSP	51.00	51.9
			P REMOVED	17.00	17.3	F BETWEEN FLT GND CREW	35.25	35.9
			Q INSTALLED	3.00	3.1	H POST/THRUFLT	12.00	12.2
			9 BNCH CK-CONDENNED	2.00	2.0			
910 CHIPPED	65.00	3.0	R REMOVE AND REPLACE	61.00	93.8	M PERIODIC/PHASED INSP	43.00	66.2
			9 BNCH CK-CONDENNED	4.00	6.2	H POST/THRUFLT	14.00	21.5
						F BETWEEN FLT GND CREW	8.00	12.3
805 NO DEF-NOC-OTH MAINT	52.60	2.4	G RPR/RPLT MINOR PARTS	43.10	81.9	F BETWEEN FLT GND CREW	23.60	44.9
			Q INSTALLED	8.50	16.2	M PERIODIC/PHASED INSP	16.70	31.7
			S REMOVE AND REINSTALL	1.00	1.9	D INFLIGHT NO ABORT	12.30	23.4
007 ARCING, ARCED	46.00	2.1	R REMOVE AND REPLACE	32.00	69.6	M PERIODIC/PHASED INSP	45.00	97.8
			P REMOVED	13.00	28.3	D INFLIGHT NO ABORT	1.00	2.2
			G RPR/RPLT MINOR PARTS	1.00	2.2			
374 INTERNAL FAILURE	43.01	2.0	R REMOVE AND REPLACE	19.00	44.2	F BETWEEN FLT GND CREW	27.01	62.8
			P REMOVED	18.00	41.9	M PERIODIC/PHASED INSP	10.00	23.3
			Y TROUBLESHOOT	6.00	14.0	D INFLIGHT NO ABORT	6.00	14.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-62 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 12

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC7 WINDOW NO 4 L AND RT (CONT.)	$23,028 LSC/YEAR	PCT OF LSC 9.70	TOTAL	LSC RNK 4	2174.84 MAN HRS	PCT OF MHR 11.88	TOTAL	MHR RNK 5	14.3825 MANHR /1000 FLT HR	

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
127 ADJMT/ALGNMT IMPROPR	36.84	1.7	L ADJUST	36.84	100.0	M PERIODIC/PHAS-D INSP	36.84	100.0
106 MISSING BOLTS,NUTS,.	29.40	1.4	G RPR/RPLT MINOR PARTS	27.40	93.2	M PERIODIC/PHASED INSP	22.20	75.5
			L ADJUST	2.00	6.8	D INFLIGHT NO ABORT	3.00	10.2
						R QC CHECK	2.30	7.8
						F BETWEEN FLT GND CREW	1.00	3.4
						S DEPOT LEVEL MAINTNCE	0.90	3.1
800 NO DEF-RMVD-OTH MAINT	28.47	1.2	Q INSTALLED	18.10	68.4	M PERIODIC/PHASED INSP	18.97	71.7
			G RPR/RPLT MINOR PARTS	7.70	29.1	F BETWEEN FLT GND CREW	4.50	17.0
			X TEST-INSPECT-SERVICE	0.67	2.5	D INFLIGHT NO ABORT	3.00	11.3
070 BROKEN	26.27	1.2	G RPR/RPLT MINOR PARTS	26.17	99.6	F BETWEEN FLT GND CREW	18.17	69.2
			P REMOVED	0.10	0.4	H POST/THRUFLT	6.00	22.8
						R QC CHECK	2.00	7.6
						S DEPOT LEVEL MAINTNCE	0.10	0.4
730 LOOSE	23.67	1.1	L ADJUST	19.17	81.0	M PERIODIC/PHASED INSP	21.17	89.4
			G RPR/RPLT MINOR PARTS	4.50	19.0	F BETWEEN FLT GND CREW	1.50	6.3
						H POST/THRUFLT	1.00	4.2
865 PROT COAT/SEALNT DEF	22.90	1.1	G RPR/RPLT MINOR PARTS	21.40	93.4	M PERIODIC/PHASED INSP	19.40	84.7
			Q INSTALLED	1.50	6.6	R QC CHECK	2.00	8.7
						F BETWEEN FLT GND CREW	1.50	6.6
020 WORN CHAFED OR FRAYD	18.60	0.9	G RPR/RPLT MINOR PARTS	18.60	100.0	M PERIODIC/PHASED INSP	11.80	63.4
						F BETWEEN FLT GND CREW	3.50	18.8
						D INFLIGHT NO ABORT	2.00	10.8
						R QC CHECK	1.30	7.0
117 DETERIORATED	16.00	0.7	G RPR/RPLT MINOR PARTS	8.00	50.0	M PERIODIC/PHASED INSP	14.00	87.5
			R REMOVE AND REPLACE	8.00	50.0	R QC CHECK	2.00	12.5
242 FAILED TO OPERATE	13.33	0.6	R REMOVE AND REPLACE	10.50	78.8	F BETWEEN FLT GND CREW	9.50	71.3
			Y TROUBLESHOOT	1.83	13.7	S DEPOT LEVEL MAINTNCE	2.50	18.8
			9 BNCH CK-CONDENNED	1.00	7.5	D INFLIGHT NO ABORT	1.33	10.0
160 CONTACTS/CONN DEFECT	11.00	0.5	G RPR/RPLT MINOR PARTS	11.00	100.0	F BETWEEN FLT GND CREW	4.00	36.4
						M PERIODIC/PHASED INSP	4.00	36.4
						D INFLIGHT NO ABORT	3.00	27.3
615 SHORTED	7.33	0.3	G RPR/RPLT MINOR PARTS	5.33	72.7	B BEFORE FLT NO ABORT	3.00	40.9
			Y TROUBLESHOOT	1.00	13.6	D INFLIGHT NO ABORT	2.33	31.8
			9 BNCH CK-CONDENNED	1.00	13.6	F BETWEEN FLT GND CREW	1.00	13.6
						H POST/THRUFLT	1.00	13.6
750 MISSING	7.00	0.3	G RPR/RPLT MINOR PARTS	7.00	100.0	H POST/THRUFLT	7.00	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-62 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 13

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC7 WINDOW NO 4 L AND RT (CONT.)	$23,028	LSC/YEAR	PCT OF LSC	9.70	TOTAL	LSC RNK 4	2174.84	MAN HRS	PCT OF MHR 11.88 TOTAL	MHR RNK 5	14.3825 MANHR /1000 F'T HR

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF HMC
472	FUSE/CKT PROT DEFECT	4.57	0.2	G	RPR/RPLT MINOR PARTS	4.57	100.0	D	INFLIGHT NO ABORT	3.67	80.3
								F	BETWEEN FLT GND CREW	0.90	19.7
230	DIRTY CONTAM SATURAT	4.25	0.2	V	CLEAN	2.25	52.9	M	PERIODIC/PHASED INSP	4.25	100.0
				Z	CORROSION REPAIR	2.00	47.1				
080	DEFECTIVE LAMP/METER	4.00	0.2	G	RPR/RPLT MINOR PARTS	4.00	100.0	D	INFLIGHT NO ABORT	4.00	100.0
169	INCORRECT VOLTAGE	4.00	0.2	G	RPR/RPLT MINOR PARTS	4.00	100.0	G	GROUND ALERT-NOT DGR	4.00	100.0
179	CORRODED-MILD/MODRTE	4.00	0.2	P	REMOVED	4.00	100.0	F	BETWEEN FLT GND CREW	4.00	100.0
660	STRIPPED	4.00	0.2	R	REMOVE AND REPLACE	4.00	100.0	M	PERIODIC/PHASED INSP	4.00	100.0
947	TORN	4.00	0.2	G	RPR/RPLT MINOR PARTS	4.00	100.0	F	BETWEEN FLT GND CREW	2.00	50.0
								J	PREFLIGHT	2.00	50.0
381	LEAKING INT OR EXT	2.00	0.1	G	RPR/RPLT MINOR PARTS	2.00	100.0	H	POST/THRUFLT	2.00	100.0
884	LEAD BROKEN	2.00	0.1	G	RPR/RPLT MINOR PARTS	2.00	100.0	Q	GROUND ALERT-NOT DGR	2.00	100.0
350	INSULATION BREAKDOWN	0.70	0.0	G	RPR/RPLT MINOR PARTS	0.70	100.0	M	PERIODIC/PHASED INSP	0.70	100.0
248	IMPROP/FAULTY MAINT	0.30	0.0	G	RPR/RPLT MINOR PARTS	0.30	100.0	F	BETWEEN FLT GND CREW	0.30	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC8 WINDOW NO 5 L AND RT — $21,111 LSC/YEAR — PCT OF LSC 8.89 TOTAL — LSC RNK 6 — 2552.42 MAN HRS — PCT OF MHR 13.94 TOTAL — MHR RNK 4 — 16.8795 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
046 DELAMINATED	697.58	27.3	R REMOVE AND REPLACE	561.78	80.5	M PERIODIC/PHASED INSP	480.08	68.8
			P REMOVED	82.80	11.9	F BETWEEN FLT GND CREW	147.50	21.1
			B BNCH CK-CONDENNED	16.00	2.3	H POST/THRUFLT	39.00	5.6
			E INITIAL INSTALLATION	10.00	1.4	4 CORROSION CONTR INSP	16.00	2.3
			Y TROUBLESHOOT	9.80	1.4	B BEFORE FLT NO ABORT	15.00	2.2
			Q INSTALLED	7.00	1.0			
			G RPR/RPLT MINOR PARTS	5.50	0.8			
			X TEST-INSPECT-SERVICE	4.20	0.6			
			F REPAIR	0.50	0.1			
799 NO DEFECT	666.56	26.1	H EQUIP CK NO RPR RQRD	354.22	53.1	M PERIODIC/PHASED INSP	562.15	84.3
			X TEST-INSPECT-SERVICE	188.73	28.3	F BETWEEN FLT GND CREW	43.80	6.6
			Q INSTALLED	123.60	18.5	H POST/THRUFLT	36.60	5.5
						B BEFORE FLT NO ABORT	9.00	1.4
						E AFTER FLIGHT	9.00	1.4
						D INFLIGHT NO ABORT	6.00	0.9
100 CRACKED	346.77	13.6	R REMOVE AND REPLACE	274.75	79.2	M PERIODIC/PHASED INSP	177.76	51.3
			B BNCH CK-CONDENNED	27.00	7.8	F BETWEEN FLT GND CREW	70.20	20.2
			P REMOVED	26.80	7.7	H POST/THRUFLT	64.80	18.7
			A BNCH CK AND REPAIRED	8.00	2.3	D INFLIGHT NO ABORT	34.00	9.8
			G RPR/RPLT MINOR PARTS	4.83	1.4			
			Q INSTALLED	4.00	1.2			
			Y TROUBLESHOOT	1.30	0.4			
			X TEST-INSPECT-SERVICE	0.08	0.0			
105 LOOSE/DMGD BOLTS,NUT	196.78	7.7	G RPR/RPLT MINOR PARTS	193.76	98.5	M PERIODIC/PHASED INSP	143.17	72.8
			L ADJUST	3.00	1.5	F BETWEEN FLT GND CREW	26.50	13.5
						D INFLIGHT NO ABORT	14.00	7.1
						H POST/THRUFLT	13.09	6.7
210 CHIPPED	105.26	4.1	R REMOVE AND REPLACE	91.25	86.7	M PERIODIC/PHASED INSP	64.26	61.0
			P REMOVED	14.00	13.3	H POST/THRUFLT	17.00	16.2
						J PREFLIGHT	10.00	9.5
						F BETWEEN FLT GND CREW	8.00	7.6
						D INFLIGHT NO ABORT	6.00	5.7
900 BURNED OR OVERHEATED	84.31	3.3	R REMOVE AND REPLACE	69.01	81.9	M PERIODIC/PHASED INSP	60.31	71.5
			B BNCH CK-CONDENNED	12.00	14.2	E AFTER FLIGHT	12.00	14.2
			P REMOVED	3.30	3.9	F BETWEEN FLT GND CREW	12.00	14.2
070 BROKEN	63.10	2.5	R REMOVE AND REPLACE	34.00	53.9	F BETWEEN FLT GND CREW	57.10	90.5
			A BNCH CK AND REPAIRED	15.30	24.2	M PERIODIC/PHASED INSP	6.00	9.5
			P REMOVED	13.00	20.6			
			G RPR/RPLT MINOR PARTS	0.50	0.8			
			B BNCH CK-CONDENNED	0.30	0.5			

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 18

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC8 WINDOW NO 5 L AND RT (CONT.) $21,111 LSC/YEAR | PCT OF LSC 8.89 TOTAL | LSC RNK 6 | 2552.42 MAN HRS | PCT OF MHR 13.94 TOTAL | MHR RNK 4 | 16.8795 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
805 NO DEF-NOC-OTH MAINT	59.37	2.3	G RPR/RPLT MINOR PARTS	22.33	37.6	F BETWEEN FLT GND CREW	38.73	65.2
			Q INSTALLED	16.33	27.5	M PERIODIC/PHASED INSP	10.93	18.4
			S REMOVE AND REINSTALL	14.00	23.6	H POST/THRUFLT	7.70	13.0
			R REMOVE AND REPLACE	6.70	11.3	D INFLIGHT NO ABORT	2.00	3.4
127 ADJMT/ALGNMT IMPROPR	53.47	2.1	L ADJUST	28.17	52.7	M PERIODIC/PHASED INSP	51.47	96.3
			G RPR/RPLT MINOR PARTS	25.30	47.3	R QC CHECK	2.00	3.7
800 NO DEF-RMVD-OTH MAINT	46.27	1.8	Q INSTALLED	17.50	37.8	M PERIODIC/PHASED INSP	24.77	53.5
			G RPR/RPLT MINOR PARTS	13.60	29.4	F BETWEEN FLT GND CREW	21.50	46.5
			S REMOVE AND REINSTALL	7.00	15.1			
			P REMOVED	5.50	11.9			
			Y TROUBLESHOOT	2.00	4.3			
			X TEST-INSPECT-SERVICE	0.67	1.4			
108 MISSING BOLTS,NUTS..	44.94	1.8	G RPR/RPLT MINOR PARTS	37.94	84.4	M PERIODIC/PHASED INSP	33.94	75.5
			A BNCH CK AND REPAIRED	7.00	15.6	H POST/THRUFLT	9.00	20.0
						F BETWEEN FLT GND CREW	2.00	4.5
865 PROT COAT/SEALNT DEF	19.77	0.8	G RPR/RPLT MINOR PARTS	17.27	87.4	M PERIODIC/PHASED INSP	19.77	100.0
			R REMOVE AND REPLACE	2.50	12.6			
986 RF WINDOW BROKEN-CRK	18.10	0.7	R REMOVE AND REPLACE	18.10	100.0	S DEPOT LEVEL MAINTNCE	18.10	100.0
117 DETERIORATED	14.90	0.6	G RPR/RPLT MINOR PARTS	5.90	39.6	M PERIODIC/PHASED INSP	8.90	59.7
			Q INSTALLED	5.00	33.6	F BETWEEN FLT GND CREW	4.00	26.8
			R REMOVE AND REPLACE	4.00	26.8	H POST/THRUFLT	2.00	13.4
730 LOOSE	14.04	0.6	L ADJUST	8.03	57.2	M PERIODIC/PHASED INSP	14.04	100.0
			G RPR/RPLT MINOR PARTS	6.00	42.7			
605 CHAZED	13.00	0.5	R REMOVE AND REPLACE	13.00	100.0	M PERIODIC/PHASED INSP	13.00	100.0
242 FAILED TO OPERATE	12.58	0.5	Y TROUBLESHOOT	12.58	100.0	D INFLIGHT NO ABORT	6.00	47.7
						M PERIODIC/PHASED INSP	6.00	47.7
						F BETWEEN FLT GND CREW	0.58	4.6
540 PUNCTURED	12.00	0.5	P REMOVED	12.00	100.0	F AFTER FLIGHT	12.00	100.0
780 BENT,BUCKLED,COLLASP	10.50	0.4	P REMOVED	8.00	76.2	F BETWEEN FLT GND CREW	8.00	76.2
			L ADJUST	2.00	19.0	M PERIODIC/PHASED INSP	2.50	23.8
			G RPR/RPLT MINOR PARTS	0.50	4.8			
240 IMPROP/FAULTY MAINT	9.00	0.4	R REMOVE AND REPLACE	8.00	88.9	M PERIODIC/PHASED INSP	8.00	88.9
			L ADJUST	1.00	11.1	R QC CHECK	1.00	11.1
935 SCORED OR SCRATCHED	9.00	0.4	R REMOVE AND REPLACE	5.00	55.6	M PERIODIC/PHASED INSP	9.00	100.0
			P REMOVED	4.00	44.4			

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3

TOTAL	FLIGHT HOURS 151,219	NO. OF FLIGHTS 54,114	LSC/YEAR $237,509	MANHOURS 18,305.37	MANHOURS/1000 FLIGHT HOURS 121.05				
11DC8 WINDOW NO 5 L AND RT (CONT.)	$21,111 LSC/YEAR	PCT OF LSC 8.89 TOTAL	LSC RNK 6	2552.42 MAN HRS	PCT OF MHR 13.94 TOTAL	MHR RNK 4	16.8795 MANHR /1000 FLT HR		
HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC	
804 NO DEF-SCH MAINT/MOD	8.00	0.3	R REMOVE AND REPLACE	8.00	100.0	M PERIODIC/PHASED INSP	8.00	100.0	
020 WORN CHAFED OR FRAYD	7.60	0.3	F REPAIR G RPR/RPLT MINOR PARTS	6.30 1.30	82.9 17.1	W IN-SHOP REPAIR M PERIODIC/PHASED INSP	6.30 1.30	82.9 17.1	
750 MISSING	8.50	0.3	Q INSTALLED	6.50	100.0	F BETWEEN FLT GND CREW H POST/THRUFLT M PERIODIC/PHASED INSP	4.00 2.00 0.50	61.5 30.8 7.7	
230 DIRTY CONTAM SATURAT	6.25	0.2	Y CLEAN	6.25	100.0	M PERIODIC/PHASED INSP R QC CHECK	4.25 2.00	68.0 32.0	
010 POOR OR INCORR FOCUS	6.00	0.2	R REMOVE AND REPLACE	6.00	100.0	M PERIODIC/PHASED INSP	6.00	100.0	
160 CONTACTS/CONN DEFECT	6.00	0.2	G RPR/RPLT MINOR PARTS	6.00	100.0	F BETWEEN FLT GND CREW	6.00	100.0	
374 INTERNAL FAILURE	6.00	0.2	R REMOVE AND REPLACE 9 BNCH CK-CONDENNED	4.00 2.00	66.7 33.3	M PERIODIC/PHASED INSP F BETWEEN FLT GND CREW	4.00 2.00	66.7 33.3	
108 BRK/MSG SAFETY WIRE	4.00	0.2	G RPR/RPLT MINOR PARTS	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0	
007 ARCING, ARCED	3.00	0.1	R REMOVE AND REPLACE	3.00	100.0	D INFLIGHT NO ABORT	3.00	100.0	
719 BRK/FRYED BND/GND WR	1.30	0.1	G RPR/RPLT MINOR PARTS	1.30	100.0	M PERIODIC/PHASED INSP	1.30	100.0	
350 INSULATION BREAKDOWN	0.50	0.0	G RPR/RPLT MINOR PARTS	0.50	100.0	M PERIODIC/PHASED INSP	0.50	100.0	

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 21

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC8 WINDSHIELD NO 1	$12,411	LSC/YEAR	PCT OF LSC 5.23	TOTAL	LSC RNK 8	1169.92 MAN HRS	PCT OF MHR 6.34	TOTAL	MHR RNK 6	7.6707 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	377.96	32.6	H EQUIP CK NO RPR RQRD	152.18	40.3	M PERIODIC/PHASED INSP	295.38	78.2
			Q INSTALLED	122.34	32.4	F BETWEEN FLT GND CREW	44.73	11.8
			X TEST-INSPECT-SERVICE	99.94	26.4	H POST/THRUFLT	19.83	5.2
			G RPR/RPLT MINOR PARTS	2.00	0.5	D INFLIGHT NO ABORT	13.50	3.6
			O	1.00	0.3	J PREFLIGHT	2.00	0.5
			B BNCH CK-NO RPR RQRD	0.50	0.1	C INFLIGHT ABORT	1.00	0.3
						O	1.00	0.3
						W IN-SHOP REPAIR	0.50	0.1
848 DELAMINATED	173.88	15.0	R REMOVE AND REPLACE	153.48	88.3	M PERIODIC/PHASED INSP	71.87	41.3
			P REMOVED	16.00	9.2	F BETWEEN FLT GND CREW	42.01	24.2
			9 BNCH CK-CONDENNED	2.50	1.4	H POST/THRUFLT	30.00	17.3
			X TEST-INSPECT-SERVICE	1.00	0.6	R QC CHECK	16.00	9.2
			Y CLEAN	0.90	0.5	D INFLIGHT NO ABORT	14.00	8.1
180 CRACKED	165.97	14.3	R REMOVE AND REPLACE	150.17	90.5	D INFLIGHT NO ABORT	93.00	56.0
			9 BNCH CK-CONDENNED	7.30	4.4	M PERIODIC/PHASED INSP	39.97	24.1
			P REMOVED	7.00	4.2	F BETWEEN FLT GND CREW	17.00	10.2
			G RPR/RPLT MINOR PARTS	1.50	0.9	H POST/THRUFLT	16.00	9.6
374 INTERNAL FAILURE	110.43	9.5	R REMOVE AND REPLACE	101.26	91.7	D INFLIGHT NO ABORT	42.76	38.7
			P REMOVED	9.17	8.3	F BETWEEN FLT GND CREW	36.01	32.6
						H POST/THRUFLT	25.17	22.8
						M PERIODIC/PHASED INSP	6.50	5.9
900 BURNED OR OVERHEATED	99.01	8.5	R REMOVE AND REPLACE	45.00	45.4	F BETWEEN FLT GND CREW	40.01	40.4
			P REMOVED	36.01	36.4	M PERIODIC/PHASED INSP	34.00	34.3
			Q INSTALLED	16.00	16.2	H POST/THRUFLT	19.00	19.2
			9 BNCH CK-CONDENNED	2.00	2.0	D INFLIGHT NO ABORT	6.00	6.1
105 LOOSE/DMGD BOLTS,NUT	60.52	5.2	G RPR/RPLT MINOR PARTS	60.52	100.0	M PERIODIC/PHASED INSP	42.39	70.0
						D INFLIGHT NO ABORT	8.30	13.7
						F BETWEEN FLT GND CREW	7.83	12.9
						H POST/THRUFLT	2.00	3.3
242 FAILED TO OPERATE	21.50	1.9	R REMOVE AND REPLACE	15.17	70.6	H POST/THRUFLT	15.17	70.6
			Y TROUBLESHOOT	6.33	29.4	F BETWEEN FLT GND CREW	4.50	20.9
						D INFLIGHT NO ABORT	1.83	8.5
805 NO DEF-NOC-OTH MAINT	19.67	1.7	G RPR/RPLT MINOR PARTS	11.50	58.5	F BETWEEN FLT GND CREW	17.67	89.8
			Q INSTALLED	4.67	23.7	M PERIODIC/PHASED INSP	2.00	10.2
			S REMOVE AND REINSTALL	3.50	17.8			
303 BIRD STRIKE DAMAGE	18.50	1.6	R REMOVE AND REPLACE	18.00	97.3	D INFLIGHT NO ABORT	12.50	67.6
			X TEST-INSPECT-SERVICE	0.50	2.7	H POST/THRUFLT	6.00	32.4
070 BROKEN	18.00	1.6	Q INSTALLED	12.00	66.7	S DEPOT LEVEL MAINTNCE	12.00	66.7

Figure A-3. B-52G/H Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

B-52 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 13, 1978 PAGE 22

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	151,214	54,114	$237,509	18,305.37	121.05

11DC6 WINDSHIELD NO 1 (CONT.)	$12,411	LSC/ YEAR	PCT OF LSC 5.23	TOTAL	LSC RNK 8	1159.92	MAN HRS	PCT OF MHR 6.34	TOTAL	MHR RNK 6	7.6707 MANHR /1000 FLT HR

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
				G	RPR/RPLT MINOR PARTS	6.00	33.3	M	PERIODIC/PHASED INSP	6.00	33.3
885	PROT COAT/SEALNT DEF	17.93	1.5	G	RPR/RPLT MINOR PARTS	15.60	87.0	M	PERIODIC/PHASED INSP	17.93	100.0
				Q	INSTALLED	2.33	13.0				
800	NO DEF-RMVD-OTH MAINT	13.42	1.1	Q	INSTALLED	5.42	43.6	F	BETWEEN FLT GND CREW	10.42	83.9
				G	RPR/RPLT MINOR PARTS	4.00	32.2	M	PERIODIC/PHASED INSP	2.00	16.1
				S	REMOVE AND REINSTALL	3.00	24.2				
007	ARCING, ARCED	11.00	0.9	R	REMOVE AND REPLACE	11.00	100.0	M	PERIODIC/PHASED INSP	11.00	100.0
117	DETERIORATED	9.60	0.8	G	RPR/RPLT MINOR PARTS	5.60	58.3	M	PERIODIC/PHASED INSP	5.50	57.3
				R	REMOVE AND REPLACE	4.00	41.7	D	INFLIGHT NO ABORT	4.00	41.7
								S	DEPOT LEVEL MAINTNCE	0.10	1.0
100	MISSING BOLTS,NUTS..	9.40	0.8	G	RPR/RPLT MINOR PARTS	9.40	100.0	M	PERIODIC/PHASED INSP	9.40	100.0
127	ADJMT/ALGNMT IMPROPR	6.67	0.6	L	ADJUST	6.67	100.0	M	PERIODIC/PHASED INSP	3.67	55.0
								B	BEFORE FLT NO ABORT	3.00	45.0
111	BURST OR RUPTURED	5.50	0.5	G	RPR/RPLT MINOR PARTS	5.50	100.0	H	POST/THRUFLT	5.50	100.0
230	DIRTY CONTAM SATURAT	4.00	0.3	V	CLEAN	4.00	100.0	B	BEFORE FLT NO ABORT	2.00	50.0
								J	PREFLIGHT	1.00	25.0
								R	QC CHECK	1.00	25.0
935	SCORED OR SCRATCHED	4.00	0.3	R	REMOVE AND REPLACE	4.00	100.0	D	INFLIGHT NO ABORT	4.00	100.0
615	SHORTED	3.45	0.3	R	REMOVE AND REPLACE	3.45	100.0	F	BETWEEN FLT GND CREW	3.45	100.0
381	LEAKING INT OR EXT	3.00	0.3	G	RPR/RPLT MINOR PARTS	3.00	100.0	F	BETWEEN FLT GND CREW	3.00	100.0
450	OPEN	3.00	0.3	Y	TROUBLESHOOT	3.00	100.0	D	INFLIGHT NO ABORT	3.00	100.0
730	LOOSE	2.50	0.2	G	RPR/RPLT MINOR PARTS	2.00	80.0	H	POST/THRUFLT	2.00	80.0
				L	ADJUST	0.50	20.0	M	PERIODIC/PHASED INSP	0.50	20.0
750	MISSING	2.00	0.2	G	RPR/RPLT MINOR PARTS	2.00	100.0	M	PERIODIC/PHASED INSP	2.00	100.0

Figure A-3. B-52G/H Design/Cost MAMS (Concluded)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAB W/S FRONT PANEL PILT $89,517 LSC/YEAR | PCT OF LSC 17.58 TOTAL | LSC RNK 1 | 8652.92 MAN HRS | PCT OF MHR 19.87 TOTAL | MHR RNK 1 | 21.6691 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MH.
190 CRACKED	2610.17	30.2	R REMOVE AND REPLACE	2205.05	84.5	F BETWEEN FLT GND CREW	1713.78	65.7
			P REMOVED	291.86	11.2	D INFLIGHT NO ABORT	526.28	20.2
			Q INSTALLED	70.00	2.7	S DEPOT LEVEL MAINTNCE	287.94	11.0
			G RPR/RPLT MINOR PARTS	14.17	0.5	J PREFLIGHT	48.00	1.8
			F REPAIR	12.00	0.5	C INFLIGHT ABORT	22.00	0.8
			X TEST-INSPECT-SERVICE	9.00	0.3	M PERIODIC/PHASED INSP	5.17	0.2
			L ADJUST	4.50	0.2	3 HOME STA CK-ISOCHRNL	4.00	0.2
			C BNCH CK-RPR DEFERRED	2.50	0.1	U NON-DESTRUCTIVE INSP	2.00	0.1
			A BNCH CK AND REPAIRED	1.08	0.0	K HOURLY POSTFLIGHT	1.00	0.0
799 NO DEFECT	1397.54	16.2	Q INSTALLED	714.08	51.1	F BETWEEN FLT GND CREW	928.39	66.4
			H EQUIP CK NO RPR RQRD	334.04	23.9	D INFLIGHT NO ABORT	178.52	12.8
			X TEST-INSPECT-SERVICE	303.12	21.7	M PERIODIC/PHASED INSP	73.26	5.2
			R REMOVE AND REPLACE	34.00	2.4	B BEFORE FLT NO ABORT	39.09	2.8
			T REMOVE FOR CANIBLZTN	7.50	0.5	J PREFLIGHT	36.80	2.6
			U RPLCD AFTER CANBLZTN	4.80	0.3	S DEPOT LEVEL MAINTNCE	34.92	2.5
						L TRAINING OR MAINTNCE	24.00	1.7
						C INFLIGHT ABORT	20.75	1.5
						H POST/THRUFLT	20.00	1.4
						A BEFORE FLT ABORT	18.05	1.3
						3 HOME STA CK-ISOCHRNL	12.00	0.9
						K HOURLY POSTFLIGHT	11.75	0.8
105 LOOSE/DMGD BOLTS,NUT	1134.65	13.1	G RPR/RPLT MINOR PARTS	994.08	87.6	F BETWEEN FLT GND CREW	807.76	71.2
			L ADJUST	113.93	10.0	M PERIODIC/PHASED INSP	213.56	18.8
			R REMOVE AND REPLACE	9.83	0.9	D INFLIGHT NO ABORT	38.26	3.4
			F REPAIR	7.00	0.6	S DEPOT LEVEL MAINTNCE	31.70	2.8
			Y TROUBLESHOOT	4.30	0.4	R QC CHECK	28.67	2.5
			A BNCH CK AND REPAIRED	3.00	0.3	K HOURLY POSTFLIGHT	5.00	0.4
			P REMOVED	2.50	0.2	3 HOME STA CK-ISOCHRNL	5.00	0.4
						B BEFORE FLT NO ABORT	3.00	0.3
						H POST/THRUFLT	1.70	0.1
007 ARCING, ARCED	685.77	7.9	R REMOVE AND REPLACE	532.25	77.6	F BETWEEN FLT GND CREW	419.94	61.2
			P REMOVED	146.51	21.4	D INFLIGHT NO ABORT	208.02	30.3
			Y TROUBLESHOOT	7.00	1.0	A BEFORE FLT ABORT	30.01	4.4
						C INFLIGHT ABORT	15.00	2.2
						H POST/THRUFLT	12.80	1.9
127 ADJMT/ALGNMT IMPROPR	370.44	4.4	L ADJUST	340.44	90.0	F BETWEEN FLT GND CREW	257.68	68.1
			Y TROUBLESHOOT	18.00	4.8	M PERIODIC/PHASED INSP	47.26	12.5
			A BNCH CK AND REPAIRED	16.00	4.2	D INFLIGHT NO ABORT	30.00	7.9
			G RPR/RPLT MINOR PARTS	4.00	1.1	J PREFLIGHT	25.50	6.7
						S DEPOT LEVEL MAINTNCE	7.00	1.8
						K HOURLY POSTFLIGHT	5.00	1.3
						H POST/THRUFLT	4.00	1.1
						W IN-SHOP REPAIR	2.00	0.5

Figure A-4. C-141A Design/Cost MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 2

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AA8 W/S FRONT PANEL PILT (CONT.) $89,517 LSC/YEAR | PCT OF LSC 17.58 TOTAL | LSC RNK 1 | 8652.92 MAN HRS | PCT OF MHR 19.87 TOTAL | MHR RNK 1 | 21.6691 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
900 BURNED OR OVERHEATED	367.42	4.2	R REMOVE AND REPLACE	295.03	80.3	F BETWEEN FLT GND CREW	328.83	89.5
			P REMOVED	60.56	16.5	C INFLIGHT ABORT	19.34	5.3
			Y TROUBLESHOOT	8.50	2.3	D INFLIGHT NO ABORT	17.25	4.7
			Q INSTALLED	3.33	0.9	J PREFLIGHT	2.00	0.5
848 DELAMINATED	288.58	3.3	R REMOVE AND REPLACE	220.71	76.6	F BETWEEN FLT GND CREW	180.71	62.6
			P REMOVED	46.01	15.9	A BEFORE FLT ABORT	36.00	12.5
			X TEST-INSPECT-SERVICE	14.20	4.9	D INFLIGHT NO ABORT	28.20	9.8
			G RPR/RPLT MINOR PARTS	7.20	2.5	J PREFLIGHT	20.00	6.9
			1 BNCH CK-NRTS-NOT ATH	0.30	0.1	3 HOME STA CK-ISOCHRNL	12.00	4.2
			9 BNCH CK-CONDENNED	0.17	0.1	H POST/THRUFLT	10.00	3.5
						M PERIODIC/PHASED INSP	1.50	0.5
						W IN-SHOP REPAIR	0.17	0.1
070 BROKEN	257.81	3.0	R REMOVE AND REPLACE	208.56	81.0	D INFLIGHT NO ABORT	103.85	40.3
			P REMOVED	38.76	15.0	F BETWEEN FLT GND CREW	97.46	37.8
			G RPR/RPLT MINOR PARTS	6.50	2.5	B BEFORE FLT NO ABORT	32.00	12.4
			A BNCH CK AND REPAIRED	3.80	1.5	E AFTER FLIGHT	18.00	7.0
						W IN-SHOP REPAIR	3.80	1.5
						S DEPOT LEVEL MAINTNCE	2.50	1.0
730 LOOSE	227.63	2.6	L ADJUST	105.22	46.2	F BETWEEN FLT GND CREW	183.73	80.7
			G RPR/RPLT MINOR PARTS	81.26	35.7	S DEPOT LEVEL MAINTNCE	25.90	11.4
			R REMOVE AND REPLACE	31.76	14.0	J PREFLIGHT	5.00	2.2
			Q INSTALLED	3.40	1.5	M PERIODIC/PHASED INSP	5.00	2.2
			F REPAIR	3.00	1.3	R QC CHECK	5.00	2.2
			K CALIBRATD-ADJMT RQRD	3.00	1.3	3 HOME STA CK-ISOCHRNL	3.00	1.3
108 MISSING BOLTS,NUTS..	181.64	2.1	G RPR/RPLT MINOR PARTS	176.97	97.4	F BETWEEN FLT GND CREW	116.85	64.3
			F REPAIR	4.67	2.6	M PERIODIC/PHASED INSP	47.75	26.3
						S DEPOT LEVEL MAINTNCE	12.03	6.6
						D INFLIGHT NO ABORT	2.00	1.1
						3 HOME STA CK-ISOCHRNL	2.00	1.1
						R QC CHECK	1.00	0.6
805 NO DEF-NOC-OTH MAINT	148.41	1.7	G RPR/RPLT MINOR PARTS	73.57	49.6	F BETWEEN FLT GND CREW	116.01	78.2
			Q INSTALLED	37.84	25.5	D INFLIGHT NO ABORT	14.50	9.8
			P REMOVED	14.50	9.8	J PREFLIGHT	5.80	3.9
			S REMOVE AND REINSTALL	13.50	9.1	M PERIODIC/PHASED INSP	5.70	3.8
			X TEST-INSPECT-SERVICE	6.00	4.0	B BEFORE FLT NO ABORT	5.40	3.6
			Y TROUBLESHOOT	3.00	2.0	A BEFORE FLT ABORT	1.00	0.7
117 DETERIORATED	111.65	1.3	G RPR/RPLT MINOR PARTS	75.47	67.6	F BETWEEN FLT GND CREW	61.84	55.4
			R REMOVE AND REPLACE	20.50	18.4	M PERIODIC/PHASED INSP	24.77	22.2
			F REPAIR	15.67	14.0	E AFTER FLIGHT	9.84	8.8
						3 HOME STA CK-ISOCHRNL	6.00	5.4
						D INFLIGHT NO ABORT	4.00	3.6

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 3

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

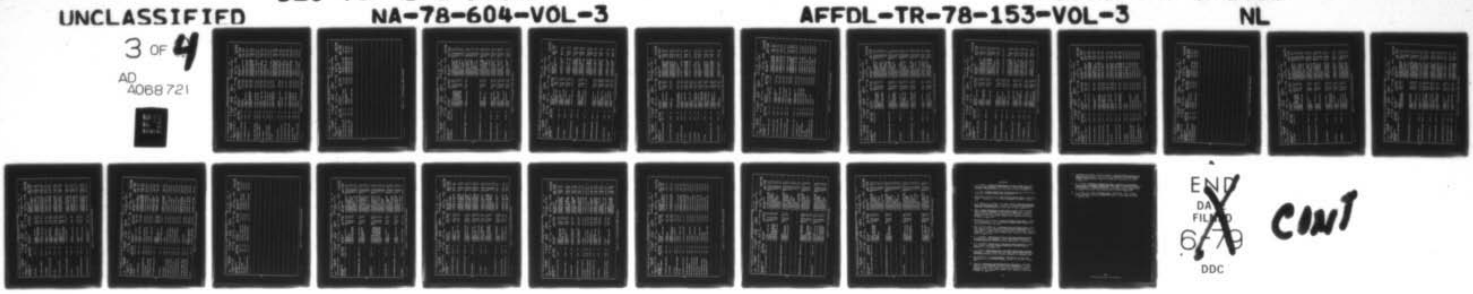
11AAB W/S FRONT PANEL PILT (CONT.) $89,517 LSC/YEAR | PCT OF LSC 17.58 TOTAL | LSC RNK 1 | 8652.92 MAN HRS | PCT OF MHR 19.87 TOTAL | MHR RNK 1 | 21.6691 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
						S DEPOT LEVEL MAINTNCE	3.20	2.9
						J PREFLIGHT	2.00	1.8
800 NO DEF-HMYD-OTH MANT	107.34	1.2	S REMOVE AND REINSTALL	36.34	33.9	F BETWEEN FLT GND CREW	62.25	58.0
			G RPR/RPLT MINOR PARTS	31.00	28.9	S DEPOT LEVEL MAINTNCE	24.58	22.9
			P REMOVED	21.50	20.0	Q SPECIAL INSPECTION	11.00	10.2
			Q INSTALLED	18.50	17.2	D INFLIGHT NO ABORT	4.50	4.2
						B BEFORE FLT NO ABORT	2.00	1.9
						J PREFLIGHT	2.00	1.9
						M PERIODIC/PHASED INSP	1.00	0.9
374 INTERNAL FAILURE	94.02	1.1	R REMOVE AND REPLACE	94.02	100.0	D INFLIGHT NO ABORT	76.02	80.9
						F BETWEEN FLT GND CREW	18.00	19.1
615 SHORTED	85.34	1.0	R REMOVE AND REPLACE	58.34	68.4	F BETWEEN FLT GND CREW	58.34	68.4
			P REMOVED	27.00	31.6	A BEFORE FLT ABORT	27.00	31.6
230 DIRTY CONTAM SATURAT	81.06	0.9	V CLEAN	78.56	96.9	M PERIODIC/PHASED INSP	41.96	51.8
			G RPR/RPLT MINOR PARTS	1.50	1.9	F BETWEEN FLT GND CREW	12.60	15.5
			X TEST-INSPECT-SERVICE	1.00	1.2	J PREFLIGHT	8.70	10.7
						3 HOME STA CK-ISOCHRNL	7.80	9.6
						D INFLIGHT NO ABORT	4.80	5.9
						S DEPOT LEVEL MAINTNCE	3.50	4.3
						K HOURLY POSTFLIGHT	1.00	1.2
						H POST/THRUFLT	0.70	0.9
020 WORN CHAFED OR FRAYD	69.48	0.8	R REMOVE AND REPLACE	44.37	63.9	F BETWEEN FLT GND CREW	49.88	71.8
			G RPR/RPLT MINOR PARTS	25.10	36.1	M PERIODIC/PHASED INSP	16.10	23.2
						3 HOME STA CK-ISOCHRNL	3.00	4.3
						K HOURLY POSTFLIGHT	0.25	0.4
						S DEPOT LEVEL MAINTNCE	0.25	0.4
381 LEAKING INT OR EXT	65.80	0.8	L ADJUST	19.00	28.9	D INFLIGHT NO ABORT	45.80	69.6
			G RPR/RPLT MINOR PARTS	18.50	28.1	F BETWEEN FLT GND CREW	20.00	30.4
			F REPAIR	15.00	22.8			
			Y TROUBLESHOOT	5.50	8.4			
			X TEST-INSPECT-SERVICE	5.30	8.1			
			R REMOVE AND REPLACE	2.50	3.8			
170 CORRODED-MILD/MODRTE	49.62	0.6	Z CORROSION REPAIR	49.62	100.0	Q SPECIAL INSPECTION	44.57	89.8
						M PERIODIC/PHASED INSP	4.55	9.2
						W IN-SHOP REPAIR	0.50	1.0
885 PROT COAT/SEALNT DEF	40.51	0.5	G RPR/RPLT MINOR PARTS	35.50	87.6	D INFLIGHT NO ABORT	17.00	42.0
			L ADJUST	5.00	12.3	F BETWEEN FLT GND CREW	16.00	39.5
						B BEFORE FLT NO ABORT	5.00	12.3
						M PERIODIC/PHASED INSP	2.00	4.9
						S DEPOT LEVEL MAINTNCE	0.50	1.2

Figure A-4. C-141A Design/Cost MAMS (Continued)

AD-A068 721 ROCKWELL INTERNATIONAL EL SEGUNDO CA LOS ANGELES DIV F/G 1/3
AIRCRAFT TRANSPARENCY FAILURE AND LOGISTICAL COST ANALYSIS. VOL--ETC(U)
DEC 78 S S BROWN F33615-77-C-3060
UNCLASSIFIED NA-78-604-VOL-3 AFFDL-TR-78-153-VOL-3 NL

3 OF 4
AD A068721

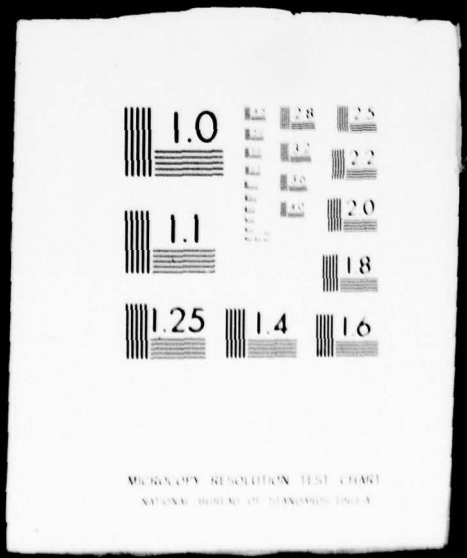


END
DATE FILMED
6-79
DDC

CONT

3 OF 4

AD
A068721



DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 4

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAB W/S FRONT PANEL PILT (CONT.) $89,617 LSC/YEAR | PCT OF LSC 17.58 TOTAL | LSC RNK 1 | 8652.92 MAN HRS | PCT OF MHR 19.87 TOTAL | MHR RNK 1 | 21.6691 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
080 DEFECTIVE LAMP/METER	31.70	0.4	P REMOVED	16.00	50.5	F BETWEEN FLT GND CREW	16.00	50.5
			Q INSTALLED	15.70	49.5	E AFTER FLIGHT	15.70	49.5
721 IMPROP RESP-ELEC IPI	28.00	0.3	R REMOVE AND REPLACE	18.00	64.3	F BETWEEN FLT GND CREW	18.00	64.3
			P REMOVED	10.00	35.7	D INFLIGHT NO ABORT	10.00	35.7
750 MISSING	27.00	0.3	G RPR/RPLT MINOR PARTS	17.50	64.8	F BETWEEN FLT GND CREW	15.00	55.6
			R REMOVE AND REPLACE	6.00	22.2	M PERIODIC/PHASED INSP	7.50	27.8
			Q INSTALLED	3.50	13.0	S DEPOT LEVEL MAINTNCE	3.00	11.1
						W IN-SHOP REPAIR	1.50	5.6
303 BIRD STRIKE DAMAGE	24.00	0.3	R REMOVE AND REPLACE	24.00	100.0	F BETWEEN FLT GND CREW	24.00	100.0
160 CONTACTS/CONN DEFECT	20.84	0.2	R REMOVE AND REPLACE	20.84	100.0	D INFLIGHT NO ABORT	20.84	100.0
167 TORQUE INCORRECT	17.80	0.2	L ADJUST	12.00	67.4	D INFLIGHT NO ABORT	14.00	78.7
			G RPR/RPLT MINOR PARTS	5.80	32.6	F BETWEEN FLT GND CREW	3.80	21.3
660 STRIPPED	16.50	0.2	P REMOVED	15.00	90.9	W IN-SHOP REPAIR	15.00	90.9
			G RPR/RPLT MINOR PARTS	1.50	9.1	F BETWEEN FLT GND CREW	1.50	9.1
997 RF WINDOW BURNED	16.00	0.2	R REMOVE AND REPLACE	16.00	100.0	J PREFLIGHT	16.00	100.0
029 CURRENT INCORRECT	13.75	0.2	R REMOVE AND REPLACE	13.75	100.0	B BEFORE FLT NO ABORT	13.75	100.0
947 TORN	11.67	0.1	G RPR/RPLT MINOR PARTS	11.00	94.3	M PERIODIC/PHASED INSP	5.67	48.6
			R REMOVE AND REPLACE	0.67	5.7	F BETWEEN FLT GND CREW	4.00	34.3
						K HOURLY POSTFLIGHT	1.00	8.6
						S DEPOT LEVEL MAINTNCE	1.00	8.6
884 LEAD BROKEN	11.50	0.1	P REMOVED	7.50	65.2	F BETWEEN FLT GND CREW	7.50	65.2
			G RPR/RPLT MINOR PARTS	4.00	34.8	D INFLIGHT NO ABORT	4.00	34.8
242 FAILED TO OPERATE	11.00	0.1	Y TROUBLESHOOT	11.00	100.0	D INFLIGHT NO ABORT	6.00	54.5
						F BETWEEN FLT GND CREW	5.00	45.5
108 BRK/MSG SAFETY WIRE	10.50	0.1	G RPR/RPLT MINOR PARTS	10.50	100.0	M PERIODIC/PHASED INSP	8.50	81.0
						D INFLIGHT NO ABORT	2.00	19.0
248 IMPROP/FAULTY MAINT	8.00	0.1	G RPR/RPLT MINOR PARTS	5.00	62.5	M PERIODIC/PHASED INSP	5.00	62.5
			R REMOVE AND REPLACE	3.00	37.5	F BETWEEN FLT GND CREW	3.00	37.5
731 BATTLE DAMAGE	8.00	0.1	R REMOVE AND REPLACE	8.00	100.0	J PREFLIGHT	8.00	100.0
008 NOISY	6.00	0.1	R REMOVE AND REPLACE	6.00	100.0	F BETWEEN FLT GND CREW	6.00	100.0
037 FLUCTUATES-UNSTABLE	2.00	0.0	P REMOVED	2.00	100.0	D INFLIGHT NO ABORT	2.00	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAB W/S FRONT PANEL PILT (CONT.)	$89,517 LSC/YEAR	PCT OF LSC 17.58	TOTAL	LSC RNK 1	8652.92 MAN HRS	PCT OF MHR 19.87	TOTAL	MHR RNK 1	21.6691 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
410 LACK OF/IMPROPR LUBE	2.00	0.0	X TEST-INSPECT-SERVICE	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
812 NO DEF-ASSOC EQP MAL	2.00	0.0	H EQUIP CK NO RPR RQRD	1.00	50.0	F BETWEEN FLT GND CREW	1.00	50.0
			Y TROUBLESHOOT	1.00	50.0	M PERIODIC/PHASED INSP	1.00	50.0
135 BINDING,STUCK,JAMMED	1.00	0.0	L ADJUST	1.00	100.0	M PERIODIC/PHASED INSP	1.00	100.0
518 IMPROPER ROUTING	1.00	0.0	G RPR/RPLT MINOR PARTS	1.00	100.0	M PERIODIC/PHASED INSP	1.00	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 6

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAR W/S CLEAR VISION PNL $66,510 LSC/YEAR | PCT OF LSC 13.07 TOTAL | LSC RNK 2 | 6854.56 MAN HRS | PCT OF MHR 15.74 TOTAL | MHR RNK 2 | 17.1656 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
799 NO DEFECT	1672.56	24.4	Q INSTALLED	751.04	44.9	F BETWEEN FLT GND CREW	1343.44	80.3
			H EQUIP CK NO RPR RQRD	438.85	26.2	D INFLIGHT NO ABORT	157.33	9.4
			X TEST-INSPECT-SERVICE	386.46	23.1	M PERIODIC/PHASED INSP	112.92	6.8
			U RPLCD AFTER CANBLZTN	41.60	2.5	K HOURLY POSTFLIGHT	21.00	1.3
			T REMOVE FOR CANIBLZTN	34.10	2.0	S DEPOT LEVEL MAINTNCE	20.00	1.2
			R REMOVE AND REPLACE	9.00	0.5	E AFTER FLIGHT	10.00	0.6
			G RPR/RPLT MINOR PARTS	7.50	0.4	3 HOME STA CK-ISOCHRNL	3.00	0.2
			J CLBRTD-NO ADJMT RQRD	2.00	0.1	J PREFLIGHT	2.20	0.1
			P REMOVED	2.00	0.1	B BEFORE FLT NO ABORT	2.17	0.1
						A BEFORE FLT ABORT	0.50	0.0
127 ADJMT/ALGNMT IMPROPR	899.88	13.1	L ADJUST	883.88	98.2	F BETWEEN FLT GND CREW	649.02	72.1
			G RPR/RPLT MINOR PARTS	16.00	1.8	D INFLIGHT NO ABORT	79.01	8.8
						M PERIODIC/PHASED INSP	77.51	8.6
						J PREFLIGHT	28.34	3.1
						S DEPOT LEVEL MAINTNCE	18.50	2.1
						B BEFORE FLT NO ABORT	14.50	1.6
						E AFTER FLIGHT	10.00	1.1
						K HOURLY POSTFLIGHT	10.00	1.1
						H POST/THRUFLT	7.00	0.8
						3 HOME STA CK-ISOCHRNL	5.00	0.6
						R QC CHECK	1.00	0.1
105 LOOSE/DMGD BOLTS,NUT	646.67	9.4	G RPR/RPLT MINOR PARTS	618.70	95.7	F BETWEEN FLT GND CREW	313.40	48.5
			F REPAIR	15.80	2.4	M PERIODIC/PHASED INSP	210.15	32.5
			L ADJUST	10.00	1.5	S DEPOT LEVEL MAINTNCE	54.61	8.4
			Y TROUBLESHOOT	1.17	0.2	K HOURLY POSTFLIGHT	33.01	5.1
			R REMOVE AND REPLACE	1.00	0.2	D INFLIGHT NO ABORT	18.00	2.8
						3 HOME STA CK-ISOCHRNL	9.00	1.4
						R QC CHECK	5.50	0.9
						B BEFORE FLT NO ABORT	3.00	0.5
935 SCORED OR SCRATCHED	574.65	8.4	R REMOVE AND REPLACE	464.84	80.9	F BETWEEN FLT GND CREW	355.37	61.8
			P REMOVED	101.31	17.6	D INFLIGHT NO ABORT	212.78	37.0
			X TEST-INSPECT-SERVICE	5.50	1.0	M PERIODIC/PHASED INSP	5.00	0.9
			Y TROUBLESHOOT	3.00	0.5	H POST/THRUFLT	1.50	0.3
381 LEAKING INT OR EXT	479.07	7.0	G RPR/RPLT MINOR PARTS	307.04	64.1	F BETWEEN FLT GND CREW	289.66	60.5
			R REMOVE AND REPLACE	70.81	14.8	D INFLIGHT NO ABORT	171.41	35.8
			F REPAIR	62.06	13.0	R QC CHECK	8.00	1.7
			L ADJUST	21.50	4.5	3 HOME STA CK-ISOCHRNL	7.00	1.5
			P REMOVED	15.00	3.1	E AFTER FLIGHT	3.00	0.6
			X TEST-INSPECT-SERVICE	2.67	0.6			
190 CRACKED	367.98	5.4	R REMOVE AND REPLACE	267.22	72.6	F BETWEEN FLT GND CREW	311.58	84.7
			P REMOVED	66.35	18.0	D INFLIGHT NO ABORT	26.50	7.2
			F REPAIR	14.90	3.8	J PREFLIGHT	16.00	4.3

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 7

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAD W/S CLEAR VISION PNL (CONT.)	$66,510	LSC/ YEAR	PCT OF LSC 13.07	TOTAL	LSC RNK 2	6854.56 MAN HRS	PCT OF MHR 15.74	TOTAL	MHR RNK 2	17.1656 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			G RPR/RPLT MINOR PARTS	10.00	2.7	S DEPOT LEVEL MAINTNCE	10.00	2.7
			Q INSTALLED	5.90	1.6	F AFTER FLIGHT	3.90	1.1
			X TEST-INSPECT-SERVICE	4.00	1.1			
			Y TROUBLESHOOT	0.50	0.1			
B48 DELAMINATED	315.92	4.6	R REMOVE AND REPLACE	262.41	83.1	F BETWEEN FLT GND CREW	262.61	83.1
			Y TROUBLESHOOT	30.00	9.5	D INFLIGHT NO ABORT	53.31	16.9
			P REMOVED	15.50	4.9			
			G RPR/RPLT MINOR PARTS	8.00	2.5			
910 CHIPPED	283.15	4.1	R REMOVE AND REPLACE	255.14	90.1	F BETWEEN FLT GND CREW	260.85	92.1
			F REPAIR	12.00	4.2	J PREFLIGHT	13.30	4.7
			P REMOVED	12.00	4.2	M PERIODIC/PHASED INSP	9.00	3.2
			Y TROUBLESHOOT	4.00	1.4			
B65 PROT COAT/SEALNT DEF	249.82	3.6	G RPR/RPLT MINOR PARTS	249.82	100.0	F BETWEEN FLT GND CREW	127.51	51.0
						D INFLIGHT NO ABORT	119.31	47.8
						3 HOME STA CK-ISOCHRNL	2.00	0.8
						M PERIODIC/PHASED INSP	1.00	0.4
117 DETERIORATED	172.15	2.5	G RPR/RPLT MINOR PARTS	106.85	62.1	F BETWEEN FLT GND CREW	136.85	79.5
			R REMOVE AND REPLACE	47.30	27.5	D INFLIGHT NO ABORT	20.30	11.8
			P REMOVED	11.00	6.4	H POST/THRUFLT	9.00	5.2
			Y TROUBLESHOOT	4.00	2.3	M PERIODIC/PHASED INSP	6.00	3.5
			X TEST-INSPECT-SERVICE	3.00	1.7			
106 MISSING BOLTS,NUTS..	131.11	1.9	G RPR/RPLT MINOR PARTS	131.11	100.0	F BETWEEN FLT GND CREW	66.51	50.7
						D INFLIGHT NO ABORT	29.50	22.5
						M PERIODIC/PHASED INSP	27.60	21.1
						S DEPOT LEVEL MAINTNCE	4.00	3.1
						R QC CHECK	3.50	2.7
900 BURNED OR OVERHEATED	129.01	1.9	R REMOVE AND REPLACE	109.01	84.5	F BETWEEN FLT GND CREW	108.01	83.7
			P REMOVED	17.00	13.2	D INFLIGHT NO ABORT	21.00	16.3
			Y TROUBLESHOOT	3.00	2.3			
805 NO DEF-NOC-OTH MAINT	105.15	1.5	G RPR/RPLT MINOR PARTS	49.31	46.9	F BETWEEN FLT GND CREW	95.40	90.7
			P REMOVED	19.30	18.4	D INFLIGHT NO ABORT	6.00	5.7
			Q INSTALLED	19.04	18.1	M PERIODIC/PHASED INSP	3.75	3.6
			S REMOVE AND REINSTALL	15.00	14.3			
			Y TROUBLESHOOT	2.50	2.4			
007 ARCING, ARCED	99.42	1.5	R REMOVE AND REPLACE	78.91	79.4	F BETWEEN FLT GND CREW	97.42	98.0
			P REMOVED	12.50	12.6	D INFLIGHT NO ABORT	2.00	2.0
			G RPR/RPLT MINOR PARTS	8.00	8.0			
605 CRAZED	90.80	1.3	R REMOVE AND REPLACE	85.80	94.5	F BETWEEN FLT GND CREW	57.00	62.8
			P REMOVED	5.00	5.5	D INFLIGHT NO ABORT	33.80	37.2

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 8

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAD W/S CLEAR VISION PNL (CONT.) $66,510 LSC/YEAR | PCT OF LSC 13.07 TOTAL | LSC RNK 2 | 6854.56 MAN HRS | PCT OF MHR 15.74 TOTAL | MHR RNK 2 | 17.1656 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
800 NO DEF-RMVD-OTH MAINT	64.75	0.9	S REMOVE AND REINSTALL	26.80	41.4	F BETWEEN FLT GND CREW	45.00	69.5
			P REMOVED	20.20	31.2	3 HOME STA CK-ISOCHRNL	12.00	18.5
			Q INSTALLED	16.00	24.7	D INFLIGHT NO ABORT	4.00	6.2
			G RPR/RPLT MINOR PARTS	1.75	2.7	B BEFORE FLT NO ABORT	2.00	3.1
						M PERIODIC/PHASED INSP	1.75	2.7
230 DIRTY CONTAM SATURAT	62.82	0.9	V CLEAN	54.82	87.3	F BETWEEN FLT GND CREW	32.50	51.7
			Y TROUBLESHOOT	8.00	12.7	D INFLIGHT NO ABORT	17.00	27.1
						M PERIODIC/PHASED INSP	12.15	19.3
						K HOURLY POSTFLIGHT	0.67	1.1
						3 HOME STA CK-ISOCHRNL	0.50	0.8
520 PITTED	61.25	0.9	R REMOVE AND REPLACE	56.00	91.4	D INFLIGHT NO ABORT	58.25	95.1
			X TEST-INSPECT-SERVICE	5.25	8.6	H POST/THRUFLT	3.00	4.9
374 INTERNAL FAILURE	45.01	0.7	R REMOVE AND REPLACE	43.01	95.6	F BETWEEN FLT GND CREW	45.01	100.0
			P REMOVED	2.00	4.4			
730 LOOSE	44.31	0.6	G RPR/RPLT MINOR PARTS	22.50	50.8	F BETWEEN FLT GND CREW	35.00	79.0
			L ADJUST	20.30	45.8	M PERIODIC/PHASED INSP	8.30	18.7
			P REMOVED	1.50	3.4	3 HOME STA CK-ISOCHRNL	1.00	2.3
750 MISSING	41.51	0.6	G RPR/RPLT MINOR PARTS	24.50	59.0	F BETWEEN FLT GND CREW	41.51	100.0
			P REMOVED	9.00	21.7			
			Q INSTALLED	8.00	19.3			
615 SHORTED	38.13	0.6	R REMOVE AND REPLACE	32.30	84.7	D INFLIGHT NO ABORT	24.80	65.0
			G RPR/RPLT MINOR PARTS	5.83	15.3	F BETWEEN FLT GND CREW	13.33	35.0
070 BROKEN	37.20	0.5	R REMOVE AND REPLACE	15.00	40.3	F BETWEEN FLT GND CREW	21.20	57.0
			P REMOVED	12.00	32.3	D INFLIGHT NO ABORT	15.00	40.3
			G RPR/RPLT MINOR PARTS	9.20	24.7	J PREFLIGHT	1.00	2.7
			A BNCH CK AND REPAIRED	1.00	2.7			
047 TORN	32.67	0.5	R REMOVE AND REPLACE	16.00	49.0	F BETWEEN FLT GND CREW	22.00	67.3
			G RPR/RPLT MINOR PARTS	14.17	43.4	D INFLIGHT NO ABORT	7.17	21.9
			P REMOVED	1.50	4.6	M PERIODIC/PHASED INSP	2.50	7.7
			X TEST-INSPECT-SERVICE	1.00	3.1	K HOURLY POSTFLIGHT	1.00	3.1
020 WORN CHAFED OR FRAYD	26.00	0.4	P REMOVED	8.00	30.8	F BETWEEN FLT GND CREW	23.00	88.5
			R REMOVE AND REPLACE	7.00	26.9	M PERIODIC/PHASED INSP	2.00	7.7
			Y TROUBLESHOOT	6.00	23.1	S DEPOT LEVEL MAINTNCE	1.00	3.8
			G RPR/RPLT MINOR PARTS	4.00	15.4			
			V CLEAN	1.00	3.8			
242 FAILED TO OPERATE	23.50	0.3	P REMOVED	9.00	38.3	F BETWEEN FLT GND CREW	12.00	51.1
			Y TROUBLESHOOT	8.50	36.2	D INFLIGHT NO ABORT	11.50	48.9

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 9

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,918	$509,055	43,537.31	109.02

11AAD W/S CLEAR VISION PNL (CONT.)	$66,510	LSC/ YEAR	PCT OF LSC 13.07	TOTAL	LSC RNK 2	6854.56 MAN HRS	PCT OF MHR 15.74	TOTAL	MHR RNK 2	17.1656 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
			X TEST-INSPECT-SERVICE	6.00	25.5			
108 BRK/MSG SAFETY WIRE	22.50	0.3	G RPR/RPLT MINOR PARTS	22.50	100.0	F BETWEEN FLT GND CREW	9.00	40.0
						S DEPOT LEVEL MAINTNCE	9.00	40.0
						M PERIODIC/PHASED INSP	4.50	20.0
334 TEMPERATURE INCORR	21.00	0.3	R REMOVE AND REPLACE	20.00	95.2	F BETWEEN FLT GND CREW	20.00	95.2
			Y TROUBLESHOOT	1.00	4.8	B BEFORE FLT NO ABORT	1.00	4.8
246 IMPROP/FAULTY MAINT	19.50	0.3	P REMOVED	17.00	87.2	F BETWEEN FLT GND CREW	17.00	87.2
			G RPR/RPLT MINOR PARTS	2.50	12.8	M PERIODIC/PHASED INSP	2.50	12.8
410 LACK OF/IMPROPR LUBE	18.00	0.3	F REPAIR	9.00	50.0	F BETWEEN FLT GND CREW	18.00	100.0
			X TEST-INSPECT-SERVICE	9.00	50.0			
988 LOSS OF VACUUM	18.00	0.3	R REMOVE AND REPLACE	18.00	100.0	F BETWEEN FLT GND CREW	18.00	100.0
135 BINDING,STUCK,JAMMED	17.17	0.3	L ADJUST	9.00	52.4	F BETWEEN FLT GND CREW	7.00	40.8
			G RPR/RPLT MINOR PARTS	4.33	25.2	D INFLIGHT NO ABORT	6.75	39.3
			V CLEAN	3.83	22.3	B BEFORE FLT NO ABORT	2.00	11.6
						M PERIODIC/PHASED INSP	1.42	8.3
780 BENT,BUCKLED,COLLASP	15.92	0.2	R REMOVE AND REPLACE	12.00	75.4	F BETWEEN FLT GND CREW	15.92	100.0
			Y TROUBLESHOOT	3.92	24.6			
710 BEARING FAILURE	14.00	0.2	G RPR/RPLT MINOR PARTS	14.00	100.0	M PERIODIC/PHASED INSP	14.00	100.0
884 LEAD BROKEN	4.00	0.1	G RPR/RPLT MINOR PARTS	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0
167 TORQUE INCORRECT	2.00	0.0	G RPR/RPLT MINOR PARTS	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
450 OPEN	2.00	0.0	Y TROUBLESHOOT	2.00	100.0	D INFLIGHT NO ABORT	2.00	100.0
660 STRIPPED	2.00	0.0	F REPAIR	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
721 IMPROP RESP-ELEC IPT	2.00	0.0	Y TROUBLESHOOT	2.00	100.0	D INFLIGHT NO ABORT	2.00	100.0
932 DOES NOT ENGAGE/LOCK	2.00	0.0	L ADJUST	2.00	100.0	B BEFORE FLT NO ABORT	2.00	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 10

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAA W/S CENTER PANEL $63,786 LSC/YEAR | PCT OF LSC 12.53 TOTAL | LSC RNK 3 | 5866.56 MAN HRS | PCT OF MHR 13.47 TOTAL | MHR RNK 5 | 14.6914 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
799 NO DEFECT	1412.16	24.1	Q INSTALLED	906.19	64.2	F BETWEEN FLT GND CREW	1104.62	78.2
			H EQUIP CK NO RPR RQRD	228.61	16.2	D INFLIGHT NO ABORT	169.08	12.0
			X TEST-INSPECT-SERVICE	175.87	12.5	M PERIODIC/PHASED INSP	67.06	4.7
			T REMOVE FOR CANIBLZTN	42.18	3.0	C INFLIGHT ABORT	26.00	1.8
			P REMOVED	19.00	1.3	J PREFLIGHT	14.30	1.0
			V CLEAN	16.30	1.2	Q SPECIAL INSPECTION	12.00	0.8
			U RPLCD AFTER CANBLZTN	13.50	1.0	S DEPOT LEVEL MAINTNCE	10.60	0.8
			G RPR/RPLT MINOR PARTS	10.50	0.7	H POST/THRUFLT	4.50	0.3
						U NON-DESTRUCTIVE INSP	2.00	0.1
						K HOURLY POSTFLIGHT	1.00	0.1
						3 HOME STA CK-ISOCHRNL	1.00	0.1
800 NO DEF-RMVD-OTH MAINT	926.38	15.8	S REMOVE AND REINSTALL	493.01	53.2	F BETWEEN FLT GND CREW	303.19	32.7
			P REMOVED	264.79	28.6	S DEPOT LEVEL MAINTNCE	269.64	29.1
			Q INSTALLED	120.12	13.3	Q SPECIAL INSPECTION	254.47	27.5
			R REMOVE AND REPLACE	24.10	2.6	E AFTER FLIGHT	56.01	6.0
			X TEST-INSPECT-SERVICE	15.34	1.7	M PERIODIC/PHASED INSP	19.75	2.1
			G RPR/RPLT MINOR PARTS	3.00	0.3	D INFLIGHT NO ABORT	14.00	1.5
			V CLEAN	3.00	0.3	R QC CHECK	8.00	0.9
						J PREFLIGHT	1.30	0.1
190 CRACKED	803.73	13.7	R REMOVE AND REPLACE	522.06	65.0	D INFLIGHT NO ABORT	318.18	39.6
			P REMOVED	175.76	21.9	F BETWEEN FLT GND CREW	300.57	37.4
			G RPR/RPLT MINOR PARTS	65.20	8.1	S DEPOT LEVEL MAINTNCE	116.30	14.5
			Y TROUBLESHOOT	15.00	1.9	H POST/THRUFLT	24.00	3.0
			A BNCH CK AND REPAIRED	10.30	1.3	M PERIODIC/PHASED INSP	18.50	2.3
			F REPAIR	8.80	1.1	C INFLIGHT ABORT	13.50	1.7
			Q INSTALLED	6.60	0.8	J PREFLIGHT	8.80	1.1
						E AFTER FLIGHT	3.90	0.5
105 LOOSE/DMGD BOLTS,NUT	690.50	11.8	G RPR/RPLT MINOR PARTS	621.50	90.0	F BETWEEN FLT GND CREW	526.15	76.2
			R REMOVE AND REPLACE	30.00	4.3	M PERIODIC/PHASED INSP	68.81	10.0
			L ADJUST	20.00	2.9	D INFLIGHT NO ABORT	48.31	7.0
			K CALIBRATD-ADJMT RQRD	19.00	2.8	J PREFLIGHT	24.00	3.5
						S DEPOT LEVEL MAINTNCE	10.20	1.5
						R QC CHECK	6.33	0.9
						H POST/THRUFLT	4.00	0.6
						3 HOME STA CK-ISOCHRNL	3.00	0.4
846 DELAMINATED	390.43	6.7	R REMOVE AND REPLACE	330.43	84.6	F BETWEEN FLT GND CREW	298.42	76.4
			P REMOVED	60.01	15.4	D INFLIGHT NO ABORT	80.01	20.5
						3 HOME STA CK-ISOCHRNL	12.00	3.1
070 BROKEN	215.30	3.7	R REMOVE AND REPLACE	154.01	71.5	F BETWEEN FLT GND CREW	106.14	49.3
			P REMOVED	24.80	11.5	D INFLIGHT NO ABORT	57.01	26.5
			G RPR/RPLT MINOR PARTS	19.99	9.3	C INFLIGHT ABORT	48.00	22.3
			Q INSTALLED	10.00	4.6	W IN-SHOP REPAIR	3.75	1.7

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 11

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAA W/S CENTER PANEL (CONT.) $63,786 LSC/YEAR | PCT OF LSC 12.53 TOTAL | LSC RNK 3 | 5066.56 MAN HRS | PCT OF MHR 13.47 TOTAL | MHR RNK 5 | 14.6914 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WMC
			A BNCH CK AND REPAIRED	6.50	3.0	J PREFLIGHT	0.40	0.2
127 ADJMT/ALGNMT IMPROPR	192.90	3.3	L ADJUST	154.89	80.3	F BETWEEN FLT GND CREW	170.43	88.4
			F REPAIR	16.00	8.3	D INFLIGHT NO ABORT	13.00	6.7
			P REMOVED	12.00	6.2	W IN-SHOP REPAIR	4.67	2.4
			A BNCH CK AND REPAIRED	5.00	2.6	S DEPOT LEVEL MAINTNCE	3.00	1.6
			G RPR/RPLT MINOR PARTS	5.00	2.6	M PERIODIC/PHASED INSP	1.80	0.9
230 DIRTY CONTAM SATURAT	156.98	2.7	V CLEAN	147.02	93.7	M PERIODIC/PHASED INSP	62.34	39.7
			P REMOVED	6.00	3.8	3 HOME STA CK-ISOCHRNL	37.07	23.6
			F REPAIR	3.67	2.3	F BETWEEN FLT GND CREW	22.90	14.6
			G RPR/RPLT MINOR PARTS	0.30	0.2	S DEPOT LEVEL MAINTNCE	22.00	14.0
						J PREFLIGHT	8.00	5.1
						W IN-SHOP REPAIR	3.67	2.3
						Q SPECIAL INSPECTION	1.00	0.6
007 ARCING, ARCED	140.61	2.4	P REMOVED	76.01	54.1	F BETWEEN FLT GND CREW	131.61	93.6
			R REMOVE AND REPLACE	55.59	39.5	D INFLIGHT NO ABORT	9.00	6.4
			Q INSTALLED	8.00	5.7			
			Y TROUBLESHOOT	1.00	0.7			
900 BURNED OR OVERHEATED	131.00	2.2	R REMOVE AND REPLACE	78.00	59.5	F BETWEEN FLT GND CREW	131.00	100.0
			P REMOVED	52.00	39.7			
			Y TROUBLESHOOT	1.00	0.8			
730 LOOSE	125.77	2.1	L ADJUST	65.51	52.1	F BETWEEN FLT GND CREW	102.77	81.7
			G RPR/RPLT MINOR PARTS	60.26	47.9	M PERIODIC/PHASED INSP	15.00	11.9
						S DEPOT LEVEL MAINTNCE	5.00	4.0
						D INFLIGHT NO ABORT	3.00	2.4
805 NO DEF-NOC-OTH MAINT	96.95	1.7	G RPR/RPLT MINOR PARTS	50.61	52.2	F BETWEEN FLT GND CREW	87.85	90.6
			Q INSTALLED	30.67	31.6	D INFLIGHT NO ABORT	6.10	6.3
			P REMOVED	12.67	13.1	C INFLIGHT ABORT	2.00	2.1
			S REMOVE AND REINSTALL	3.00	3.1	M PERIODIC/PHASED INSP	1.00	1.0
170 CORRODED-MILD/MODRTE	93.78	1.6	Z CORROSION REPAIR	88.78	94.7	Q SPECIAL INSPECTION	86.11	91.6
			G RPR/RPLT MINOR PARTS	5.00	5.3	F BETWEEN FLT GND CREW	5.00	5.3
						K HOURLY POSTFLIGHT	2.67	2.8
117 DETERIORATED	84.77	1.4	F REPAIR	48.93	57.7	Q SPECIAL INSPECTION	48.93	57.7
			R REMOVE AND REPLACE	23.84	28.1	F BETWEEN FLT GND CREW	35.84	42.3
			G RPR/RPLT MINOR PARTS	12.00	14.2			
920 WORN CHAFED OR FRAYD	74.01	1.3	P REMOVED	33.01	44.6	F BETWEEN FLT GND CREW	63.01	85.1
			R REMOVE AND REPLACE	28.00	37.8	J PREFLIGHT	6.00	8.1
			F REPAIR	6.00	8.1	M PERIODIC/PHASED INSP	5.00	6.8
			G RPR/RPLT MINOR PARTS	5.00	6.8			
			A BNCH CK AND REPAIRED	2.00	2.7			

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 12

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAA W/S CENTER PANEL (CONT.)	$63,786	LSC/ YEAR	PCT OF LSC 12.53	TOTAL	LSC RNK 3	5866.56	MAN HRS	PCT OF MHR 13.47	TOTAL	MHR RNK 5	14.6914	MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
167 TORQUE INCORRECT	58.00	1.0	G RPR/RPLT MINOR PARTS	33.00	56.9	F BETWEEN FLT GND CREW	34.00	58.6
			L ADJUST	25.00	43.1	D INFLIGHT NO ABORT	24.00	41.4
108 MISSING BOLTS,NUTS,.	52.76	0.9	G RPR/RPLT MINOR PARTS	52.76	100.0	F BETWEEN FLT GND CREW	29.76	56.4
						M PERIODIC/PHASED INSP	21.00	39.8
						S DEPOT LEVEL MAINTNCE	2.00	3.8
242 FAILED TO OPERATE	44.50	0.8	R REMOVE AND REPLACE	40.00	89.9	H POST/THRUFLT	40.00	89.9
			Y TROUBLESHOOT	4.50	10.1	D INFLIGHT NO ABORT	3.00	6.7
						F BETWEEN FLT GND CREW	1.50	3.4
246 IMPROP/FAULTY MAINT	28.05	0.5	R REMOVE AND REPLACE	17.75	63.3	F BETWEEN FLT GND CREW	21.75	77.5
			G RPR/RPLT MINOR PARTS	10.30	36.7	M PERIODIC/PHASED INSP	6.30	22.5
780 BENT,BUCKLED,COLLASP	25.50	0.4	R REMOVE AND REPLACE	16.00	62.7	F BETWEEN FLT GND CREW	19.50	76.5
			Y TROUBLESHOOT	6.00	23.5	D INFLIGHT NO ABORT	6.00	23.5
			G RPR/RPLT MINOR PARTS	3.50	13.7			
804 NO DEF-SCH MAINT/MOD	18.92	0.3	P REMOVED	18.00	95.1	F BETWEEN FLT GND CREW	10.92	57.7
			G RPR/RPLT MINOR PARTS	0.92	4.9	Q SPECIAL INSPECTION	8.00	42.3
750 MISSING	16.47	0.3	G RPR/RPLT MINOR PARTS	10.00	60.7	F BETWEEN FLT GND CREW	12.67	76.9
			Q INSTALLED	4.67	28.4	D INFLIGHT NO ABORT	2.00	12.1
			F REPAIR	1.80	10.9	S DEPOT LEVEL MAINTNCE	1.80	10.9
865 PROT COAT/SEALNT DEF	15.00	0.3	G RPR/RPLT MINOR PARTS	15.00	100.0	D INFLIGHT NO ABORT	8.00	53.3
						F BETWEEN FLT GND CREW	7.00	46.7
108 BRK/MSG SAFETY WIRE	10.50	0.2	G RPR/RPLT MINOR PARTS	8.50	81.0	M PERIODIC/PHASED INSP	8.00	76.2
			A BNCH CK AND REPAIRED	2.00	19.0	F BETWEEN FLT GND CREW	2.00	19.0
						3 HOME STA CK-ISOCHRNL	0.50	4.8
910 CHIPPED	9.00	0.2	P REMOVED	9.00	100.0	F BETWEEN FLT GND CREW	9.00	100.0
660 STRIPPED	8.50	0.1	P REMOVED	8.50	100.0	W IN-SHOP REPAIR	4.50	52.9
						F BETWEEN FLT GND CREW	4.00	47.1
135 BINDING,STUCK,JAMMED	8.00	0.1	G RPR/RPLT MINOR PARTS	8.00	100.0	F BETWEEN FLT GND CREW	8.00	100.0
381 LEAKING INT OR EXT	8.00	0.1	Y TROUBLESHOOT	8.00	100.0	F BETWEEN FLT GND CREW	8.00	100.0
116 CUT	6.50	0.1	R REMOVE AND REPLACE	6.50	100.0	F BETWEEN FLT GND CREW	6.50	100.0
410 LACK OF/IMPROPR LUBE	5.60	0.1	X TEST-INSPECT-SERVICE	5.60	100.0	F BETWEEN FLT GND CREW	5.60	100.0
181 COMPRESSION LOW	4.40	0.1	Q INSTALLED	4.40	100.0	E AFTER FLIGHT	4.40	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 13

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAA W/S CENTER PANEL (CONT.) $63,786 LSC/YEAR PCT OF LSC 12.53 TOTAL LSC RNK 3 5866.56 MAN HRS PCT OF MHR 13.47 TOTAL MHR RNK 5 14.6914 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
999 DEFECTIVE LAMP/METER	4.00	0.1	R REMOVE AND REPLACE	4.00	100.0	J PREFLIGHT	4.00	100.0
884 LEAD BROKEN	4.00	0.1	G RPR/RPLT MINOR PARTS	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0
935 SCORED OR SCRATCHED	2.00	0.0	P REMOVED	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
988 IMPROPER HANDLING	1.60	0.0	G RPR/RPLT MINOR PARTS	1.60	100.0	F BETWEEN FLT GND CREW	1.60	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 14

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAC W/S SIDE PANEL $63,051 LSC/YEAR | PCT OF LSC 12.39 TOTAL | LSC RNK 4 | 5925.80 MAN HRS | PCT OF MHR 13.61 TOTAL | MHR RNK 4 | 14.8397 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WMC
799 NO DEFECT	1460.06	24.6	Q INSTALLED	760.27	52.1	F BETWEEN FLT GND CREW	1162.60	79.6
			H EQUIP CK NO RPR RQRD	345.03	23.6	D INFLIGHT NO ABORT	144.07	9.9
			X TEST-INSPECT-SERVICE	264.74	18.1	M PERIODIC/PHASED INSP	87.51	6.0
			U RPLCD AFTER CANBLZTN	31.51	2.2	J PREFLIGHT	17.50	1.2
			T REMOVE FOR CANIBLZTN	26.67	1.8	K HOURLY POSTFLIGHT	12.50	0.9
			L ADJUST	21.34	1.5	H POST/THRUFLT	12.00	0.8
			P REMOVED	5.50	0.4	S DEPOT LEVEL MAINTNCE	11.13	0.8
			G RPR/RPLT MINOR PARTS	5.00	0.3	B BEFORE FLT NO ABORT	4.75	0.3
						R QC CHECK	4.00	0.3
						3 HOME STA CK-ISOCHRNL	3.00	0.2
						E AFTER FLIGHT	1.00	0.1
935 SCORED OR SCRATCHED	586.80	9.9	R REMOVE AND REPLACE	454.28	77.4	F BETWEEN FLT GND CREW	374.45	63.8
			P REMOVED	91.01	15.5	D INFLIGHT NO ABORT	168.35	28.7
			Y TROUBLESHOOT	33.00	5.6	M PERIODIC/PHASED INSP	22.00	3.7
			V CLEAN	8.50	1.4	E AFTER FLIGHT	20.00	3.4
						S DEPOT LEVEL MAINTNCE	2.00	0.3
105 LOOSE/DMGD BOLTS,NUT	567.08	9.6	G RPR/RPLT MINOR PARTS	497.79	87.8	F BETWEEN FLT GND CREW	244.10	43.0
			L ADJUST	53.79	9.5	M PERIODIC/PHASED INSP	187.99	33.2
			F REPAIR	8.00	1.4	D INFLIGHT NO ABORT	71.01	12.5
			P REMOVED	5.50	1.0	S DEPOT LEVEL MAINTNCE	48.89	8.6
			A BNCH CK AND REPAIRED	2.00	0.4	K HOURLY POSTFLIGHT	7.00	1.2
						3 HOME STA CK-ISOCHRNL	5.10	0.9
						R QC CHECK	2.00	0.4
						J PREFLIGHT	1.00	0.2
848 DELAMINATED	506.37	8.5	R REMOVE AND REPLACE	338.84	66.9	F BETWEEN FLT GND CREW	333.10	65.8
			F REPAIR	87.02	17.2	D INFLIGHT NO ABORT	107.01	21.1
			P REMOVED	73.01	14.4	M PERIODIC/PHASED INSP	51.26	10.1
			G RPR/RPLT MINOR PARTS	5.25	1.0	3 HOME STA CK-ISOCHRNL	15.00	3.0
			X TEST-INSPECT-SERVICE	2.00	0.4			
			1 BNCH CK-NRTS-NOT ATH	0.25	0.0			
605 CRAZED	487.94	8.2	R REMOVE AND REPLACE	408.68	83.8	F BETWEEN FLT GND CREW	298.92	61.3
			P REMOVED	73.76	15.1	D INFLIGHT NO ABORT	130.01	26.6
			V CLEAN	3.00	0.6	M PERIODIC/PHASED INSP	59.01	12.1
			Y TROUBLESHOOT	2.50	0.5			
100 CRACKED	380.66	6.4	H REMOVE AND REPLACE	191.72	50.4	S DEPOT LEVEL MAINTNCE	190.41	50.0
			F REPAIR	104.00	27.3	F BETWEEN FLT GND CREW	129.91	34.1
			G RPR/RPLT MINOR PARTS	32.37	8.5	D INFLIGHT NO ABORT	24.20	6.4
			P REMOVED	30.10	7.9	M PERIODIC/PHASED INSP	23.67	6.2
			A BNCH CK AND REPAIRED	18.80	4.9	H POST/THRUFLT	7.80	2.0
			Y TROUBLESHOOT	3.67	1.0	3 HOME STA CK-ISOCHRNL	2.00	0.5
						U NON-DESTRUCTIVE INSP	1.67	0.4
						W IN-SHOP REPAIR	1.00	0.3

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 15

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399 320	246,916	$509,055	43,537.31	109.02

11AAC W/S SIDE PANEL (CONT.) $63,051 LSC/YEAR | PCT OF LSC 12.39 TOTAL | LSC RNK 4 | 5925.80 MAN HRS | PCT OF MHR 13.61 TOTAL | MHR RNK 4 | 14.8397 MANHR /1000 F. HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WMC
127 ADJMT/ALGNMT IMPROPR	378.33	6.4	L ADJUST	330.52	87.4	F BETWEEN FLT GND CREW	267.57	70.7
			R REMOVE AND REPLACE	23.67	6.3	M PERIODIC/PHASED INSP	43.00	11.4
			G RPR/RPLT MINOR PARTS	20.13	5.3	D INFLIGHT NO ABORT	36.75	9.7
			X TEST-INSPECT-SERVICE	4.00	1.1	J PREFLIGHT	15.50	4.1
						S DEPOT LEVEL MAINTNCE	11.00	2.9
						K HOURLY POSTFLIGHT	2.00	0.5
						R QC CHECK	1.50	0.4
						B BEFORE FLT NO ABORT	1.00	0.3
800 NO DEF-RMVD-OTH MAINT	150.31	2.5	S REMOVE AND REINSTALL	55.56	37.0	S DEPOT LEVEL MAINTNCE	79.75	53.1
			R REMOVE AND REPLACE	51.00	33.9	F BETWEEN FLT GND CREW	52.11	34.7
			P REMOVED	18.00	12.0	M PERIODIC/PHASED INSP	8.50	5.7
			D	12.00	8.0	D INFLIGHT NO ABORT	3.25	2.2
			Q INSTALLED	10.25	6.8	3 HOME STA CK-ISOCHRNL	3.00	2.0
			G RPR/RPLT MINOR PARTS	3.50	2.3	N GROUNT ALERT-DEGRAD	2.20	1.5
						Q SPECIAL INSPECTION	1.50	1.0
007 ARCING, ARCED	146.78	2.5	R REMOVE AND REPLACE	125.77	85.7	F BETWEEN FLT GND CREW	110.77	75.5
			P REMOVED	21.00	14.3	D INFLIGHT NO ABORT	36.01	24.5
805 NO DEF-NOC-OTH MAINT	108.60	1.8	G RPR/RPLT MINOR PARTS	63.20	58.2	F BETWEEN FLT GND CREW	89.40	82.3
			Q INSTALLED	29.20	26.9	D INFLIGHT NO ABORT	12.20	11.2
			S REMOVE AND REINSTALL	6.20	5.7	M PERIODIC/PHASED INSP	6.00	5.5
			X TEST-INSPECT-SERVICE	6.00	5.5	B BEFORE FLT NO ABORT	1.00	0.9
			P REMOVED	4.00	3.7			
381 LEAKING INT OR EXT	89.19	1.5	G RPR/RPLT MINOR PARTS	50.44	55.9	F BETWEEN FLT GND CREW	51.56	57.2
			L ADJUST	35.01	38.8	D INFLIGHT NO ABORT	35.14	39.0
			X TEST-INSPECT-SERVICE	3.75	4.2	B BEFORE FLT NO ABORT	3.00	3.3
			Y TROUBLESHOOT	1.09	1.1	M PERIODIC/PHASED INSP	0.50	0.6
020 WORN CHAFED OR FRAYD	88.77	1.5	G RPR/RPLT MINOR PARTS	83.60	94.2	S DEPOT LEVEL MAINTNCE	68.00	76.6
			A BNCH CK AND REPAIRED	4.17	4.7	M PERIODIC/PHASED INSP	12.10	13.6
			Y CLEAN	1.00	1.1	W IN-SHOP REPAIR	4.17	4.7
						F BETWEEN FLT GND CREW	4.00	4.5
						K HOURLY POSTFLIGHT	0.50	0.6
900 BURNED OR OVERHEATED	88.22	1.5	R REMOVE AND REPLACE	44.01	49.9	F BETWEEN FLT GND CREW	70.21	79.6
			P REMOVED	42.21	47.8	D INFLIGHT NO ABORT	18.00	20.4
			Y TROUBLESHOOT	2.00	2.3			
885 PROT COAT/SEALNT DEF	85.51	1.4	G RPR/RPLT MINOR PARTS	85.51	100.0	D INFLIGHT NO ABORT	63.51	74.3
						F BETWEEN FLT GND CREW	22.00	25.7
108 MISSING BOLTS,NUTS..	81.09	1.4	G RPR/RPLT MINOR PARTS	80.59	99.4	M PERIODIC/PHASED INSP	40.55	50.1
			Y CLEAN	0.50	0.6	F BETWEEN FLT GND CREW	32.64	40.3
						3 HOME STA CK-ISOCHRNL	4.50	5.6

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 16

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAC W/S SIDE PANEL (CONT:)	$63,051	LSC/YEAR	PCT OF LSC 12.39	TOTAL	LSC RNK 4	5925.80	MAN HRS	PCT OF MHR 13.61	TOTAL	MHR RNK 4	14.8397	MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						S DEPOT LEVEL MAINTNCE	2.80	3.5
						Q INFLIGHT NO ABORT	0.50	0.6
070 BROKEN	70.51	1.2	R REMOVE AND REPLACE	41.01	58.2	D INFLIGHT NO ABORT	39.01	55.3
			P REMOVED	15.00	21.3	F BETWEEN FLT GND CREW	27.00	38.3
			G RPR/RPLT MINOR PARTS	12.50	17.7	J PREFLIGHT	2.50	3.5
			A BNCH CK AND REPAIREQ	2.00	2.8	M PERIODIC/PHASED INSP	2.00	2.8
167 TORQUE INCORRECT	65.76	1.1	L ADJUST	57.76	87.8	F BETWEEN FLT GND CREW	38.76	58.9
			G RPR/RPLT MINOR PARTS	8.00	12.2	D INFLIGHT NO ABORT	20.00	30.4
						M PERIODIC/PHASED INSP	7.00	10.6
615 SHORTED	65.67	1.1	R REMOVE AND REPLACE	61.25	93.3	D INFLIGHT NO ABORT	48.00	73.1
			P REMOVED	4.42	6.7	F BETWEEN FLT GND CREW	17.67	26.9
804 NO DEF-SCH MAINT/MOD	53.20	0.9	R REMOVE AND REPLACE	37.20	69.9	S DEPOT LEVEL MAINTNCE	37.20	69.9
			S REMOVE AND REINSTALL	14.00	26.3	F BETWEEN FLT GND CREW	16.00	30.1
			P REMOVED	2.00	3.8			
947 TORN	48.25	0.8	F REPAIR	24.00	49.7	F BETWEEN FLT GND CREW	41.00	85.0
			R REMOVE AND REPLACE	15.00	31.1	M PERIODIC/PHASED INSP	7.00	14.5
			G RPR/RPLT MINOR PARTS	9.25	19.2	K HOURLY POSTFLIGHT	0.25	0.5
242 FAILED TO OPERATE	47.84	0.8	R REMOVE AND REPLACE	21.67	45.3	F BETWEEN FLT GND CREW	31.67	66.2
			Y TROUBLESHOOT	18.67	39.0	D INFLIGHT NO ABORT	15.67	32.8
			P REMOVED	4.00	8.4	M PERIODIC/PHASED INSP	0.50	1.0
			X TEST-INSPECT-SERVICE	3.00	6.3			
			G RPR/RPLT MINOR PARTS	0.50	1.0			
170 CORRODED-MILD/MODRTE	46.26	0.8	Z CORROSION REPAIR	46.26	100.0	Q SPECIAL INSPECTION	44.76	96.8
						F BETWEEN FLT GND CREW	1.00	2.2
						M PERIODIC/PHASED INSP	0.50	1.1
730 LOOSE	42.51	0.7	L ADJUST	32.00	75.3	F BETWEEN FLT GND CREW	33.01	77.7
			G RPR/RPLT MINOR PARTS	10.50	24.7	J PREFLIGHT	4.50	10.6
						S DEPOT LEVEL MAINTNCE	3.00	7.1
						M PERIODIC/PHASED INSP	2.00	4.7
910 CHIPPED	34.00	0.6	R REMOVE AND REPLACE	24.00	70.6	F BETWEEN FLT GND CREW	34.00	100.0
			L ADJUST	10.00	29.4			
230 DIRTY CONTAM SATURAT	30.90	0.5	V CLEAN	27.90	90.3	F BETWEEN FLT GND CREW	14.80	47.9
			X TEST-INSPECT-SERVICE	3.00	9.7	D INFLIGHT NO ABORT	10.00	32.4
						M PERIODIC/PHASED INSP	4.10	13.3
						3 HOME STA CK-ISOCHRNL	2.00	6.5
780 BENT,BUCKLED,COLLASP	29.01	0.5	R REMOVE AND REPLACE	27.01	93.1	F BETWEEN FLT GND CREW	29.01	100.0
			Y TROUBLESHOOT	2.00	6.9			

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 17

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAC W/S SIDE PANEL (CONT.)	$63,051	LSC/YEAR	PCT OF LSC 12.39	TOTAL	LSC RNK 1	5926.80 MAN HRS	PCT OF MHR 13.61	TOTAL	MHR RNK 1	14.8397 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF WAC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF WAC
450 OPEN	21.50	0.4	R REMOVE AND REPLACE	19.50	90.7	D INFLIGHT NO ABORT	19.50	90.7
			L ADJUST	2.00	9.3	F BETWEEN FLT GND CREW	2.00	9.3
117 DETERIORATED	19.50	0.3	G RPR/RPLT MINOR PARTS	9.50	51.4	F BETWEEN FLT GND CREW	13.50	73.0
			F REPAIR	9.00	48.6	S DEPOT LEVEL MAINTNCE	3.00	16.2
						M PERIODIC/PHASED INSP	2.00	10.8
99H NO DEF-OPERATOR ERR	18.00	0.3	R REMOVE AND REPLACE	18.00	100.0	S DEPOT LEVEL MAINTNCE	18.00	100.0
840 PUNCTURED	16.00	0.3	G RPR/RPLT MINOR PARTS	16.00	100.0	F BETWEEN FLT GND CREW	16.00	100.0
639 SENSITIVITY INCORR	15.00	0.3	P REMOVED	15.00	100.0	D INFLIGHT NO ABORT	15.00	100.0
108 BRK/MSG SAFETY WIRE	11.00	0.2	G RPR/RPLT MINOR PARTS	11.00	100.0	M PERIODIC/PHASED INSP	7.00	63.6
						D INFLIGHT NO ABORT	4.00	36.4
721 IMPROP RESP-ELEC IPT	10.50	0.2	P REMOVED	4.00	38.1	F BETWEEN FLT GND CREW	7.50	71.4
			L ADJUST	3.00	28.6	D INFLIGHT NO ABORT	3.00	28.6
			R REMOVE AND REPLACE	2.00	19.0			
			Y TROUBLESHOOT	1.50	14.3			
750 MISSING	9.00	0.2	G RPR/RPLT MINOR PARTS	9.00	100.0	F BETWEEN FLT GND CREW	7.00	77.8
						S DEPOT LEVEL MAINTNCE	2.00	22.2
660 STRIPPED	8.67	0.1	P REMOVED	8.67	100.0	W IN-SHOP REPAIR	8.67	100.0
808 DRONE NOT RECOVERED	8.00	0.1	R REMOVE AND REPLACE	8.00	100.0	F BETWEEN FLT GND CREW	8.00	100.0
802 FAILED DUE TO OTHMAL	7.00	0.1	X TEST-INSPECT-SERVICE	7.00	100.0	D INFLIGHT NO ABORT	7.00	100.0
812 NO DEF-ASSOC EQP MAL	6.00	0.1	X TEST-INSPECT-SERVICE	6.00	100.0	D INFLIGHT NO ABORT	6.00	100.0
374 INTERNAL FAILURE	5.00	0.1	R REMOVE AND REPLACE	5.00	100.0	F BETWEEN FLT GND CREW	5.00	100.0
410 LACK OF/IMPROPR LUBE	5.00	0.1	X TEST-INSPECT-SERVICE	5.00	100.0	D INFLIGHT NO ABORT	5.00	100.0
932 DOES NOT ENGAGE/LOCK	5.00	0.1	L ADJUST	5.00	100.0	M PERIODIC/PHASED INSP	3.00	60.0
						3 HOME STA CK-ISOCHRNL	2.00	40.0
993 OPEN FILAMENT/IUBECT	4.50	0.1	Y TROUBLESHOOT	4.50	100.0	D INFLIGHT NO ABORT	4.50	100.0
135 BINDING,STUCK,JAMMED	4.00	0.1	L ADJUST	4.00	100.0	F BETWEEN FLT GND CREW	4.00	100.0
080 DEFECTIVE LAMP/METER	3.00	0.1	G RPR/RPLT MINOR PARTS	2.00	66.7	F BETWEEN FLT GND CREW	3.00	100.0
			R REMOVE AND REPLACE	1.00	33.3			
116 CUT	2.50	0.0	G RPR/RPLT MINOR PARTS	2.50	100.0	F BETWEEN FLT GND CREW	2.50	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 18

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAC W/S SIDE PANEL (CONT.)	$63,051	LSC/ YEAR	PCT OF LSC 12.39	TOTAL	LSC RNK 4	5925.80	MAN HRS	PCT OF MHR 13.61	TOTAL	MHR RNK 4	14.8397 MANHR /1000 FLT HR

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
248	IMPROP/FAULTY MAINT	2.00	0.0	G	RPR/RPLT MINOR PARTS	2.00	100.0	M	PERIODIC/PHASED INSP	2.00	100.0
884	LEAD BROKEN	2.00	0.0	G	RPR/RPLT MINOR PARTS	2.00	100.0	F	BETWEEN FLT GND CREW	2.00	100.0
520	PITTED	1.50	0.0	X	TEST-INSPECT-SERVICE	1.50	100.0	H	POST/THRUFLT	1.50	100.0
718	BRK/FRYED BND/GND WR	1.50	0.0	R	REMOVE AND REPLACE	1.50	100.0	F	BETWEEN FLT GND CREW	1.50	100.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 19

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAU W/S FRONT PNL COPILT $57.576 LSC/YEAR | PCT OF LSC 11.31 TOTAL | LSC RNK 5 | 6030.35 MAN HRS | PCT OF MHR 13.85 TOTAL | MHR RNK 3 | 15.1015 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
190 CRACKED	1906.91	31.6	R REMOVE AND REPLACE	1497.71	78.5	F BETWEEN FLT GND CREW	1218.16	63.9
			P REMOVED	346.16	18.2	D INFLIGHT NO ABORT	422.74	22.2
			Q INSTALLED	32.70	1.7	C INFLIGHT ABORT	59.67	3.1
			Y TROUBLESHOOT	16.04	0.8	M PERIODIC/PHASED INSP	50.10	2.6
			F REPAIR	6.00	0.3	A BEFORE FLT ABORT	48.14	2.5
			X TEST-INSPECT-SERVICE	5.00	0.3	B BEFORE FLT NO ABORT	48.00	2.5
			G RPR/RPLT MINOR PARTS	3.30	0.2	H POST/THRUFLT	39.34	2.1
						U NON-DESTRUCTIVE INSP	12.84	0.7
						J PREFLIGHT	4.92	0.3
						S DEPOT LEVEL MAINTNCE	3.00	0.2
105 LOOSE/DMGD BOLTS,NUT	864.67	14.3	G RPR/RPLT MINOR PARTS	763.41	88.3	F BETWEEN FLT GND CREW	575.36	66.5
			L ADJUST	84.27	9.7	M PERIODIC/PHASED INSP	150.32	17.4
			K CALIBRATD-ADJMT RQRD	12.00	1.4	D INFLIGHT NO ABORT	83.44	9.6
			R REMOVE AND REPLACE	4.00	0.5	S DEPOT LEVEL MAINTNCE	34.30	4.0
			Y TROUBLESHOOT	1.00	0.1	K HOURLY POSTFLIGHT	9.50	1.1
						3 HOME STA CK-ISOCHRNL	5.30	0.6
						R QC CHECK	4.00	0.5
						4 CORROSION CONTR INSP	1.25	0.1
						J PREFLIGHT	1.20	0.1
799 NO DEFECT	842.01	14.0	Q INSTALLED	407.11	48.3	F BETWEEN FLT GND CREW	648.13	77.0
			X TEST-INSPECT-SERVICE	236.13	28.0	D INFLIGHT NO ABORT	107.77	12.8
			H EQUIP CK NO RPR RQRD	184.97	22.0	M PERIODIC/PHASED INSP	33.80	4.0
			T REMOVE FOR CANIBLZTN	8.00	1.0	C INFLIGHT ABORT	15.00	1.8
			U RPLCD AFTER CANBLZTN	3.00	0.4	S DEPOT LEVEL MAINTNCE	10.00	1.2
			B BNCH CK-NO RPR RQRD	1.00	0.1	E AFTER FLIGHT	6.00	0.7
			G RPR/RPLT MINOR PARTS	1.00	0.1	3 HOME STA CK-ISOCHRNL	6.00	0.7
			J CLBRTD-NO ADJMT RQRD	0.50	0.1	J PREFLIGHT	5.80	0.7
			V CLEAN	0.30	0.0	K HOURLY POSTFLIGHT	5.50	0.7
						A BEFORE FLT ABORT	2.00	0.2
						H POST/THRUFLT	2.00	0.2
007 ARCING, ARCED	321.47	5.3	R REMOVE AND REPLACE	287.27	89.4	F BETWEEN FLT GND CREW	134.51	41.8
			P REMOVED	27.00	8.4	D INFLIGHT NO ABORT	84.70	26.3
			Y TROUBLESHOOT	7.20	2.2	A BEFORE FLT ABORT	43.50	13.5
						H POST/THRUFLT	26.76	8.3
						M PERIODIC/PHASED INSP	24.00	7.5
						B BEFORE FLT NO ABORT	8.00	2.5
127 ADJMT/ALGNMT IMPROPR	202.16	3.4	L ADJUST	166.16	82.2	F BETWEEN FLT GND CREW	151.11	74.7
			G RPR/RPLT MINOR PARTS	24.00	11.9	M PERIODIC/PHASED INSP	29.05	14.4
			P REMOVED	12.00	5.9	D INFLIGHT NO ABORT	14.00	6.9
						J PREFLIGHT	6.00	3.0
						S DEPOT LEVEL MAINTNCE	2.00	1.0
070 BROKEN	183.59	3.0	R REMOVE AND REPLACE	181.79	99.0	F BETWEEN FLT GND CREW	104.61	57.0

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 20

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAU W/S FRONT PNL COPILT (CONT.) $57,576 LSC/YEAR | PCT OF LSC 11.31 TOTAL | LSC RNK 5 | 6030.35 MAN HRS | PCT OF MHR 13.85 TOTAL | MHR RNK 3 | 15.1015 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
			Y TROUBLESHOOT	1.80	1.0	D INFLIGHT NO ABORT	77.18	42.0
						B BEFORE FLT ABORT	1.80	1.0
900 BURNED OR OVERHEATED	182.52	3.0	R REMOVE AND REPLACE	149.02	81.6	F BETWEEN FLT GND CREW	146.01	80.0
			P REMOVED	32.50	17.8	D INFLIGHT NO ABORT	36.50	20.0
			Y TROUBLESHOOT	1.00	0.5			
106 MISSING BOLTS,NUTS..	169.99	2.8	G RPR/RPLT MINOR PARTS	168.69	99.2	F BETWEEN FLT GND CREW	110.71	65.1
			Y TROUBLESHOOT	1.30	0.8	M PERIODIC/PHASED INSP	37.14	21.8
						D INFLIGHT NO ABORT	16.34	9.6
						A BEFORE FLT ABORT	4.17	2.5
						S DEPOT LEVEL MAINTNCE	1.63	1.0
805 NO DEF-NOC-OTH MAINT	168.25	2.8	G RPR/RPLT MINOR PARTS	103.86	61.7	F BETWEEN FLT GND CREW	126.45	75.2
			Q INSTALLED	23.50	14.0	D INFLIGHT NO ABORT	33.00	19.6
			S REMOVE AND REINSTALL	22.25	13.2	B BEFORE FLT NO ABORT	4.60	2.7
			P REMOVED	18.63	11.1	A BEFORE FLT ABORT	2.20	1.3
						M PERIODIC/PHASED INSP	2.00	1.2
848 DELAMINATED	153.21	2.5	R REMOVE AND REPLACE	129.46	84.5	D INFLIGHT NO ABORT	69.70	45.5
			P REMOVED	13.50	8.8	F BETWEEN FLT GND CREW	69.46	45.3
			G RPR/RPLT MINOR PARTS	5.25	3.4	M PERIODIC/PHASED INSP	13.00	8.5
			Y TROUBLESHOOT	2.70	1.8	K HOURLY POSTFLIGHT	0.75	0.5
			F REPAIR	2.00	1.3	3 HOME STA CK-ISOCHRNL	0.30	0.2
			A BNCH CK AND REPAIRED	0.30	0.2			
615 SHORTED	131.56	2.2	R REMOVE AND REPLACE	115.86	88.1	D INFLIGHT NO ABORT	80.10	60.9
			G RPR/RPLT MINOR PARTS	12.70	9.7	F BETWEEN FLT GND CREW	40.46	30.8
			Y TROUBLESHOOT	3.00	2.3	C INFLIGHT ABORT	11.00	8.4
730 LOOSE	123.52	2.0	L ADJUST	63.09	51.1	F BETWEEN FLT GND CREW	86.45	70.0
			G RPR/RPLT MINOR PARTS	50.12	40.6	S DEPOT LEVEL MAINTNCE	18.40	14.9
			R REMOVE AND REPLACE	5.80	4.7	M PERIODIC/PHASED INSP	9.17	7.4
			K CALIBRATD-ADJMT RQRD	3.00	2.4	D INFLIGHT NO ABORT	3.00	2.4
			Q INSTALLED	1.50	1.2	3 HOME STA CK-ISOCHRNL	3.00	2.4
						J PREFLIGHT	2.50	2.0
						R QC CHECK	1.00	0.8
381 LEAKING INT OR EXT	117.28	1.9	G RPR/RPLT MINOR PARTS	37.30	31.8	F BETWEEN FLT GND CREW	64.51	55.0
			R REMOVE AND REPLACE	30.80	26.3	D INFLIGHT NO ABORT	52.77	45.0
			P REMOVED	30.00	25.6			
			L ADJUST	19.17	16.3			
242 FAILED TO OPERATE	109.01	1.8	R REMOVE AND REPLACE	79.41	72.8	F BETWEEN FLT GND CREW	61.20	56.1
			Y TROUBLESHOOT	29.60	27.2	D INFLIGHT NO ABORT	47.81	43.9
865 PROT COAT/SEALNT DEF	70.59	1.2	G RPR/RPLT MINOR PARTS	70.59	100.0	F BETWEEN FLT GND CREW	58.84	83.4
						D INFLIGHT NO ABORT	9.00	12.7

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUC6 ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 21

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$509,055	43,537.31	109.02

11AAU W/S FRONT PNL COPILT (CONT.)	$57,576 LSC/YEAR	PCT OF LSC 11.31 TOTAL	LSC RNK 5	6030.35 MAN HRS	PCT OF MHR 13.85 TOTAL	MHR RNK 3	15.1015 MANHR /1000 FLT HR		

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
						K HOURLY POSTFLIGHT	2.75	3.9
800 NO DEF-MMYD-OTH MAINT	67.89	1.1	P REMOVED	31.84	46.9	F BETWEEN FLT GND CREW	48.89	72.0
			G RPR/RPLT MINOR PARTS	12.00	17.7	D INFLIGHT NO ABORT	14.00	20.6
			S REMOVE AND REINSTALL	11.55	17.0	3 HOME STA CK-ISOCHRNL	4.00	5.9
			Q INSTALLED	6.50	9.6	M PERIODIC/PHASED INSP	1.00	1.5
			J CLBRTD-NO ADJMT RQRD	6.00	8.8			
374 INTERNAL FAILURE	62.00	1.0	R REMOVE AND REPLACE	51.00	82.3	D INFLIGHT NO ABORT	24.00	38.7
			Y TROUBLESHOOT	9.00	14.5	F BETWEEN FLT GND CREW	15.00	24.2
			L ADJUST	2.00	3.2	M PERIODIC/PHASED INSP	12.00	19.4
						H POST/THRUFLT	11.00	17.7
117 DETERIORATED	54.96	0.9	G RPR/RPLT MINOR PARTS	40.96	74.5	F BETWEEN FLT GND CREW	44.21	80.4
			R REMOVE AND REPLACE	14.00	25.5	S DEPOT LEVEL MAINTNCE	5.00	9.1
						D INFLIGHT NO ABORT	3.75	6.8
						A QC CHECK	2.00	3.6
248 IMPROP/FAULTY MAINT	38.01	0.8	G RPR/RPLT MINOR PARTS	22.00	57.9	F BETWEEN FLT GND CREW	35.01	92.1
			R REMOVE AND REPLACE	16.00	42.1	K HOURLY POSTFLIGHT	2.00	5.3
						M PERIODIC/PHASED INSP	1.00	2.6
937 OVERHEATED CATHOD ST	31.00	0.5	P REMOVED	31.00	100.0	F BETWEEN FLT GND CREW	31.00	100.0
605 CHAZED	28.01	0.5	R REMOVE AND REPLACE	28.01	100.0	F BETWEEN FLT GND CREW	28.01	100.0
968 RF WINDOW BROKEN-CRK	24.00	0.4	R REMOVE AND REPLACE	24.00	100.0	C INFLIGHT ABORT	24.00	100.0
935 SCORED OR SCRATCHED	22.00	0.4	Y TROUBLESHOOT	12.00	54.5	F BETWEEN FLT GND CREW	12.00	54.5
			R REMOVE AND REPLACE	10.00	45.5	D INFLIGHT NO ABORT	10.00	45.5
020 WORN CHAFED OR FRAYD	21.00	0.3	Y TROUBLESHOOT	12.00	57.1	F BETWEEN FLT GND CREW	13.00	61.9
			G RPR/RPLT MINOR PARTS	5.00	23.8	D INFLIGHT NO ABORT	4.00	19.0
			P REMOVED	4.00	19.0	M PERIODIC/PHASED INSP	4.00	19.0
750 MISSING	20.90	0.3	G RPR/RPLT MINOR PARTS	13.00	62.2	F BETWEEN FLT GND CREW	10.90	52.2
			Q INSTALLED	7.90	37.8	J PREFLIGHT	5.50	26.3
						H POST/THRUFLT	3.00	14.4
						M PERIODIC/PHASED INSP	1.50	7.2
635 SENSITIVITY INCORP	20.50	0.3	P REMOVED	20.50	100.0	M PERIODIC/PHASED INSP	20.50	100.0
230 DIRTY CONTAM SATURAT	20.47	0.3	Y CLEAN	18.47	90.2	J PREFLIGHT	7.30	35.7
			G RPR/RPLT MINOR PARTS	2.00	9.8	F BETWEEN FLT GND CREW	5.70	27.8
						M PERIODIC/PHASED INSP	4.67	22.8
						3 HOME STA CK-ISOCHRNL	2.00	9.8
						H POST/THRUFLT	0.80	3.9

Figure A-4. C-141A Design/Cost MAMS (Continued)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

C-141 TRANSPARENCY WUCS ONAC AND SHOP 1/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 22

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	399,320	246,916	$50,055	43,537.31	109.02

11AAU W/S FRONT PNL COPILT (CONT.) $57,576 LSC/YEAR | PCT OF LSC 11.31 TOTAL | LSC RNK 5 | 6030.35 MAN HRS | PCT OF MHR 13.85 TOTAL | MHR RNK 3 | 15.1015 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF HMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF HMC
107 TORQUE INCORRECT	12.90	0.2	L ADJUST	11.90	92.2	F BETWEEN FLT GND CREW	9.00	69.8
			G RPR/RPLT MINOR PARTS	1.00	7.8	D INFLIGHT NO ABORT	2.90	22.5
						M PERIODIC/PHASED INSP	1.00	7.8
812 NO DEF-ASSOC EQP MAL	9.00	0.1	P REMOVED	5.00	55.6	F BETWEEN FLT GND CREW	9.00	100.0
			Y TROUBLESHOOT	4.00	44.4			
660 STRIPPED	7.80	0.1	P REMOVED	3.50	44.9	F BETWEEN FLT GND CREW	6.50	83.3
			G RPR/RPLT MINOR PARTS	3.00	38.5	M PERIODIC/PHASED INSP	1.30	16.7
			R REMOVE AND REPLACE	1.30	16.7			
520 PITTED	6.00	0.1	R REMOVE AND REPLACE	6.00	100.0	R QC CHECK	6.00	100.0
135 BINDING,STUCK,JAMMED	5.30	0.1	P REMOVED	5.30	100.0	F BETWEEN FLT GND CREW	5.30	100.0
947 TORN	5.00	0.1	G RPR/RPLT MINOR PARTS	5.00	100.0	B BEFORE FLT NO ABORT	3.50	70.0
						M PERIODIC/PHASED INSP	1.50	30.0
108 BRK/MSG SAFETY WIRE	4.75	0.1	G RPR/RPLT MINOR PARTS	4.75	100.0	F BETWEEN FLT GND CREW	4.25	89.5
						M PERIODIC/PHASED INSP	0.50	10.5
780 BENT,BUCKLED,COLLASP	4.00	0.1	P REMOVED	4.00	100.0	B BEFORE FLT NO ABORT	4.00	100.0
884 LEAD BROKEN	4.00	0.1	G RPR/RPLT MINOR PARTS	4.00	100.0	D INFLIGHT NO ABORT	4.00	100.0
916 INCIP FAIL IND BYOIL	3.00	0.0	N ASSEMBLE	3.00	100.0	S DEPOT LEVEL MAINTNCE	3.00	100.0
160 CONTACTS/CONN DEFECT	2.70	0.0	G RPR/RPLT MINOR PARTS	2.70	100.0	B BEFORE FLT NO ABORT	2.70	100.0
804 NO DEF-SCH MAINT/MOD	2.25	0.0	P REMOVED	2.25	100.0	M PERIODIC/PHASED INSP	2.25	100.0
910 CHIPPED	2.00	0.0	X TEST-INSPECT-SERVICE	2.00	100.0	F BETWEEN FLT GND CREW	2.00	100.0
064 INCORR MODULATION	1.70	0.0	Y TROUBLESHOOT	1.70	100.0	D INFLIGHT NO ABORT	1.70	100.0
334 TEMPERATURE INCORR	1.50	0.0	Y TROUBLESHOOT	1.50	100.0	D INFLIGHT NO ABORT	1.50	100.0
510 IMPROPER ROUTING	1.00	0.0	G RPR/RPLT MINOR PARTS	1.00	100.0	M PERIODIC/PHASED INSP	1.00	100.0

Figure A-4. C-141A Design/Cost MAMS (Concluded)

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-38 TRANSPARENCY WUCS ONAC AND SHOP 10/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 1

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	249,221	612,542	$717,483	27,576.43	110.65

11211 CANOPY ASSY STUDENTS $245,322 LSC/YEAR | PCT OF LSC 34.19 TOTAL | LSC RNK 1 | 12048.40 MAN HRS | PCT OF MHR 43.69 TOTAL | MHR RNK 1 | 48.3442 MANHR /1000 FLT HR

HOW MALFUNCTION CODE NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE NAME	MAN HOURS	PERCENT OF MMC
127 ADJMT/ALGNMT IMPROPR	3993.32	33.1	L ADJUST	3558.01	89.1	M PERIODIC/PHASED INSP	1554.12	38.9
			G RPR/RPLT MINOR PARTS	198.12	5.0	F BETWEEN FLT GND CREW	1478.61	37.0
			F REPAIR	134.19	3.4	K HOURLY POSTFLIGHT	730.55	18.3
			P REMOVED	30.67	0.8	D INFLIGHT NO ABORT	67.51	1.7
			X TEST-INSPECT-SERVICE	28.42	0.7	S DEPOT LEVEL MAINTNCE	53.18	1.3
			A BNCH CK AND REPAIRED	24.42	0.6	H POST/THRUFLT	35.67	0.9
			K CALIBRATD-ADJMT RQRD	9.00	0.2	C INFLIGHT ABORT	26.01	0.7
			Y TROUBLESHOOT	8.08	0.2	P FUNCTIONAL CK FLT	19.84	0.5
			C BNCH CK-RPR DEFERRED	1.50	0.0	A BEFORE FLT ABORT	12.34	0.3
						R QC CHECK	12.17	0.3
						J PREFLIGHT	3.33	0.1
800 NO DEF-RMVD-OTH MAINT	3404.93	20.0	P REMOVED	1924.34	80.0	F BETWEEN FLT GND CREW	1589.20	66.1
			Q INSTALLED	412.49	17.2	M PERIODIC/PHASED INSP	373.73	15.5
			S REMOVE AND REINSTALL	60.43	2.5	K HOURLY POSTFLIGHT	287.89	12.0
			R REMOVE AND REPLACE	4.33	0.2	Q SPECIAL INSPECTION	44.26	1.8
			F REPAIR	2.00	0.1	D INFLIGHT NO ABORT	41.26	1.7
			X TEST-INSPECT-SERVICE	1.33	0.1	H POST/THRUFLT	25.92	1.1
						P FUNCTIONAL CK FLT	12.67	0.5
						A BEFORE FLT ABORT	12.00	0.5
						E AFTER FLIGHT	7.75	0.3
						C INFLIGHT ABORT	3.67	0.2
						J PREFLIGHT	2.00	0.1
						R QC CHECK	1.75	0.1
						B BEFORE FLT NO ABORT	1.50	0.1
						G GROUND ALERT-NOT DGR	1.33	0.1
301 LEAKING INT OR EXT	2246.76	18.6	A BNCH CK AND REPAIRED	1024.03	45.6	F BETWEEN FLT GND CREW	1056.54	47.0
			G RPR/RPLT MINOR PARTS	781.65	34.8	M PERIODIC/PHASED INSP	935.93	41.7
			F REPAIR	376.74	16.8	D INFLIGHT NO ABORT	81.68	3.6
			P REMOVED	46.18	2.1	H POST/THRUFLT	76.77	3.4
			Q INSTALLED	12.50	0.6	K HOURLY POSTFLIGHT	52.34	2.3
			X TEST-INSPECT-SERVICE	3.00	0.1	P FUNCTIONAL CK FLT	33.01	1.5
			C BNCH CK-RPR DEFERRED	1.00	0.0	C INFLIGHT ABORT	10.50	0.5
			Y TROUBLESHOOT	1.00	0.0			
			R REMOVE AND REPLACE	0.67	0.0			
799 NO DEFECT	2150.10	17.8	Q INSTALLED	1676.67	78.0	F BETWEEN FLT GND CREW	1367.28	63.6
			X TEST-INSPECT-SERVICE	393.16	18.3	M PERIODIC/PHASED INSP	352.82	16.4
			P REMOVED	25.51	1.2	K HOURLY POSTFLIGHT	289.39	13.5
			H EQUIP CK NO RPR RQRD	24.67	1.1	D INFLIGHT NO ABORT	41.01	1.9
			L ADJUST	16.34	0.8	Q SPECIAL INSPECTION	27.76	1.3
			T REMOVE FOR CANIBLZTN	5.58	0.3	C INFLIGHT ABORT	24.84	1.2
			U RPLCD AFTER CANBLZTN	5.00	0.2	H POST/THRUFLT	16.42	0.8
			G RPR/RPLT MINOR PARTS	2.50	0.1	P FUNCTIONAL CK FLT	13.42	0.6
			R REMOVE AND REPLACE	0.67	0.0	A BEFORE FLT ABORT	10.00	0.5
						E AFTER FLIGHT	4.50	0.2

Figure A-5. T-38A Design/Cost MAMS

DESIGN/COST MAINTENANCE ANALYSIS MODEL

T-38 TRANSPARENCY WUCS ONAC AND SHOP 10/76-6/77 - MARSHALL STA 11-C3 MAR. 14, 1978 PAGE 5 4

	FLIGHT HOURS	NO. OF FLIGHTS	LSC/YEAR	MANHOURS	MANHOURS/1000 FLIGHT HOURS
TOTAL	249,221	612,542	$717,483	27,570.43	110.65

11311 CANOPY ASSY INSTR $179,004 LSC/YEAR | PCT OF LSC 24.95 TOTAL | LSC RNK 2 | 9049.58 MAN HRS | PCT OF MHR 32.82 TOTAL | MHR RNK 2 | 36.3114 MANHR /1000 FLT HR

HOW MALFUNCTION CODE	NAME	MAN HOURS	PERCENT OF WUC	ACTION TAKEN CODE	NAME	MAN HOURS	PERCENT OF MMC	WHEN DISCOVERED CODE	NAME	MAN HOURS	PERCENT OF MMC
127	ADJMT/ALGNMT IMPROPR	2816.35	31.1	L	ADJUST	2643.99	93.9	M	PERIODIC/PHASED INSP	1024.88	36.4
				G	RPR/RPLT MINOR PARTS	78.18	2.8	F	BETWEEN FLT GND CREW	909.75	32.3
				A	BNCH CK AND REPAIRED	26.51	0.9	K	HOURLY POSTFLIGHT	753.72	26.8
				X	TEST-INSPECT-SERVICE	22.92	0.8	C	INFLIGHT ABORT	35.51	1.3
				F	REPAIR	22.09	0.8	D	INFLIGHT NO ABORT	33.51	1.2
				P	REMOVED	18.67	0.7	H	POST/1HRUFLT	30.34	1.1
				Y	TROUBLESHOOT	4.00	0.1	P	FUNCTIONAL CK FLT	11.00	0.4
								A	BEFORE FLT ABORT	10.00	0.4
								R	QC CHECK	3.83	0.1
								B	BEFORE FLT NO ABORT	2.50	0.1
								E	AFTER FLIGHT	1.33	0.0
800	NO DEF-RMVD-OTH MAINT	1927.98	21.3	P	REMOVED	1523.30	79.0	F	BETWEEN FLT GND CREW	1287.09	66.8
				Q	INSTALLED	362.07	18.8	M	PERIODIC/PHASED INSP	279.05	14.5
				S	REMOVE AND REINSTALL	33.84	1.8	K	HOURLY POSTFLIGHT	275.72	14.3
				R	REMOVE AND REPLACE	6.75	0.4	D	INFLIGHT NO ABORT	29.09	1.5
				F	REPAIR	2.00	0.1	A	BEFORE FLT ABORT	12.17	0.6
								Q	SPECIAL INSPECTION	11.67	0.6
								H	POST/1HRUFLT	10.50	0.5
								P	FUNCTIONAL CK FLT	7.58	0.4
								E	AFTER FLIGHT	4.50	0.2
								C	INFLIGHT ABORT	3.83	0.2
								B	BEFORE FLT NO ABORT	3.75	0.2
								J	PREFLIGHT	1.50	0.1
								R	QC CHECK	1.50	0.1
799	NO DEFECT	1743.54	19.3	Q	INSTALLED	1401.47	80.4	F	BETWEEN FLT GND CREW	980.48	56.7
				X	TEST-INSPECT-SERVICE	301.14	17.3	M	PERIODIC/PHASED INSP	340.40	19.5
				P	REMOVED	18.59	1.1	K	HOURLY POSTFLIGHT	249.13	14.3
				H	EQUIP CK NO RPR RQRD	12.75	0.7	D	INFLIGHT NO ABORT	50.43	2.9
				L	ADJUST	6.25	0.4	A	BEFORE FLT ABORT	34.76	2.0
				R	REMOVE AND REPLACE	2.83	0.2	H	POST/1HRUFLT	23.17	1.3
				G	RPR/RPLT MINOR PARTS	0.50	0.0	Q	SPECIAL INSPECTION	21.17	1.2
								P	FUNCTIONAL CK FLT	9.67	0.6
								C	INFLIGHT ABORT	9.17	0.5
								S	DEPOT LEVEL MAINTNCE	6.00	0.3
								E	AFTER FLIGHT	4.58	0.3
								B	BEFORE FLT NO ABORT	2.58	0.1
								J	PREFLIGHT	2.00	0.1
								R	QC CHECK	2.00	0.1
381	LEAKING INT OR EXT	1326.93	14.7	A	BNCH CK AND REPAIRED	590.28	44.5	F	BETWEEN FLT GND CREW	831.75	62.7
				F	REPAIR	446.50	33.6	M	PERIODIC/PHASED INSP	291.31	22.0
				G	RPR/RPLT MINOR PARTS	230.21	17.3	D	INFLIGHT NO ABORT	109.10	8.2
				R	REMOVE AND REPLACE	48.76	3.7	H	POST/1HRUFLT	30.92	2.9
				P	REMOVED	10.67	0.8	K	HOURLY POSTFLIGHT	27.67	2.1
				9	BNCH CK-CONDENNED	0.50	0.0	P	FUNCTIONAL CK FLT	25.67	1.9

Figure A-5. T-38A Design/Cost MAMS (Concluded)

REFERENCES

1. J. H. Carlson, "Windshield/Canopy/Support Structure (WCSS) Lite Cycle Cost and Failure Analysis," AFFDL-TR-115, Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, OH 45433, September 1975

2. C. S. King, "Windshield/Canopy Cost and Failure Analysis," UDRI-TR-76-69, University of Dayton, Dayton, Ohio, October 1976

3. Department of the Air Force, "USAF Cost and Planning Factors," AFR 173-10, Volume I, Headquarters, US Air Force, Washington, DC 20330, 6 February 1975

4. W. D. Dotseth, R. W. Nickel, W. E. Routh, "Low-Cost Aircraft Structural Repair and Maintenance Study," AFFDL-TR-76-73, Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, OH 45433, August 1976

5. IROS, "Increased Reliability of Operational Systems," K051, AFLC/AFSC Pamphlet 400-11, Department of the Air Force, Headquarters, Air Force Logistics Command (AFLC) Wright-Patterson Air Force Base, OH 45433, Headquarters, Air Force Systems Command (AFSC) Andrews Air Force Base, DC 20334, 16 August 1974

6. Department of the Air Force, "Product Performance System (D056)," AFLCM 171-45, Headquarters, Air Force Logistics Command Wright-Patterson Air Force Base, OH 45433, April 1971

7. MDCS, Air Force Manual 66-1, "Maintenance Data Collection System," AFLC/AFSC Pamphlet 400-11, Department of the Air Force, Headquarters, Air Force Logistics Command (AFLC) Wright-Patterson Air Force Base, OH 45433, Headquarters, Air Force Systems Command (AFSC) Andrews Air Force Base, DC 20334, 16 August 1974

8. W. G. Shirreffs, "Qualification Test of T-38 Cockpit Enclosure System for Structural I.D.E. Approval," Norair Report Number NOR-61-235, Northrop Corporation, Aircraft Division, Hawthorne, CA, 6 October 1961

9. W. G. Shirreffs, "Design Test of Instructors Canted Windshield," Norair Report Number NOR-63-146, Northrop Corporation, Aircraft Division, Hawthorne, CA, 5 September 1963

10. J. A. Porter, "Qualification Test of 8-13965-5 Electrically Anti-iced Windshield," Contract F33657-68-C-1036, Norair Report Number NOR-69-117, Northrop Corporation Aircraft Division, Hawthorne, CA, September 1969

11. AFSC DH Series 2-0, "Design Handbook," Department of the Air Force, Headquarters Air Force Systems Command, Andrews AFB, DC 20334, 25 April 1977

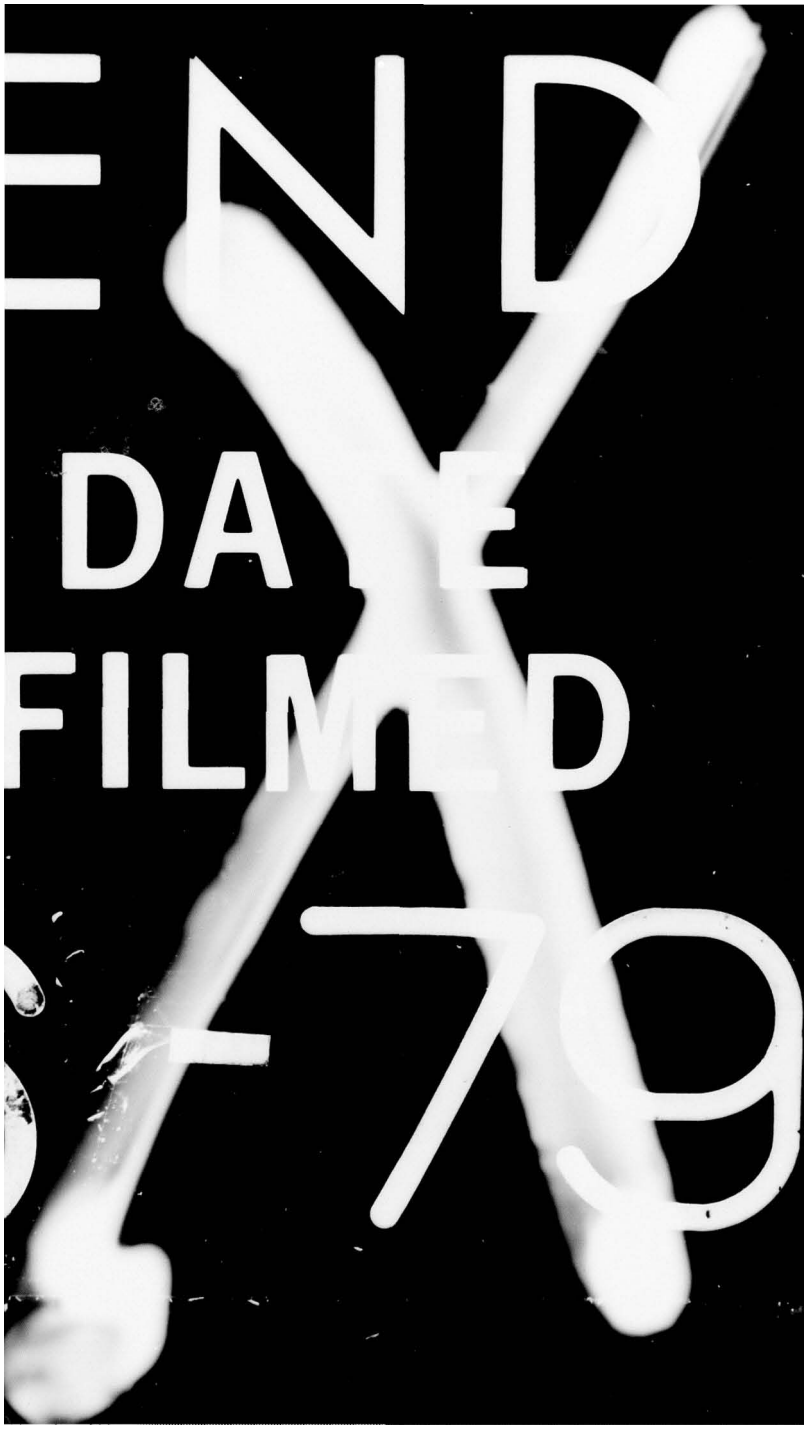
12. Logistics, "Reliability and Maintainability Data Sources," AFLC/AFSC Pamphlet 400-11, Department of the Air Force, Headquarters, Air Force Logistics Command (AFLC) Wright-Patterson Air Force Base, OH 45433, Headquarters, Air Force Systems Command (AFSC) Andrews Air Force Base, DC 20334, 16 August 1974

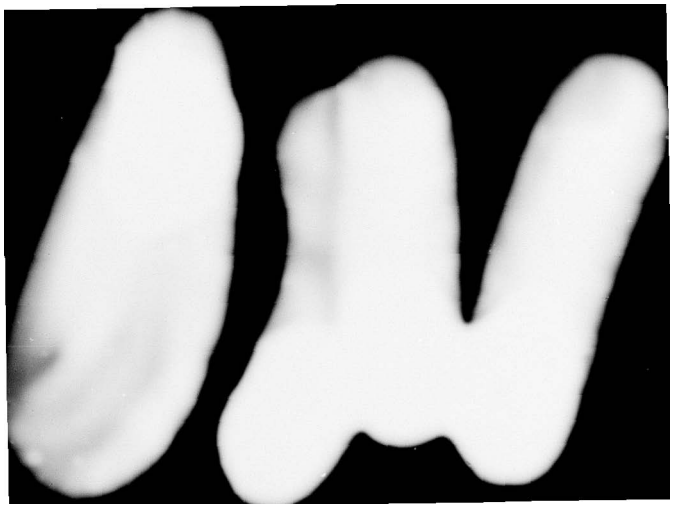
13. Department of Defense, Military Standard, "Work Breakdown Structures for Defense Materiel Items," MIL-STD-881A, Headquarters, Air Force Systems Command, Directorate Cost Analysis, Andrews Air Force Base, DC 20334, 25 April 1975

14. W. J. Dixon, "Biomedical Computer Programs - University of California Publications in Automatic Computation," BMD Number 2, Library of Congress Catalog Number: 72-98008, University of California Press, Berkeley and Los Angeles California, Third Edition 1973, Second Printing 1974

15. J. C. Sims, 1Lt., USAF, "Climatic Data," AFSC Letter - WE, Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, OH 45433, 17 January 1978

☆U.S.Government Printing Office: 1979 — 657-002/504


END
DATE
FILMED
-79



AD-A068 721 ROCKWELL INTERNATIONAL EL SEGUNDO CA LOS ANGELES DIV F/G 1/3
AIRCRAFT TRANSPARENCY FAILURE AND LOGISTICAL COST ANALYSIS. VOL--ETC(U)
DEC 78 S S BROWN F33615-77-C-3060
UNCLASSIFIED NA-78-604-VOL-3 AFFDL-TR-78-153-VOL-3 NL

4 of 4
AD A 068721

END
DATE FILMED
7-80
DTIC


D A
068

SUPPLEMENTARY

INFORMATION

AD-A068721

ERRATA - July 1979

The corrections on the following four pages are applicable to AFFDL-TR-78-153, "Aircraft Transparency Failure & Logistical Cost Analysis - Volume III Transparency Analysis," December 1978.

AIR FORCE FLIGHT DYNAMICS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

Some of the units for the logistical support cost parameters are in error. The last paragraph should read as follows.

The equations that resulted from the analysis are shown in table 5 thorugh 7. A typical example of the equation derived is the equation for logistic support cost per 100 flight hours for canopies (table 5) which is equal to:

-19.46402 - 0.65119 (transparent area in $in.^2$/100) + 13.85458 (number of transparent panels) + 28.92589 (height of transparency from ground in ft) - 0.17236 (cruise altitude in ft/100) + 21.04333 (stall speed in knots/100) - 2.34853 (landing distance in ft/100) - 1.08204 (A/C gross weight in lb/1000) - 8.88644 (maximum G-loads) - 1.05456 (flight hours per A/C per year/100)

A sample calculation using this equation is as follows.

A-7 canopy logistic support cost per 100 flight hours = - 19.46402 - 0.65119 (2618 ÷ 100) + 13.85458 (1) + 28.92589 (9) - 0.17236 (27000 ÷ 100) + 21.04333 (145 ÷ 100) - 2.34853 (3350 ÷ 100) - 1.08204 (39325 ÷ 1000) - 8.88644 (7) - 1.05456 (102726 ÷ 367 ÷ 100) = $35.267.

Note: 35.267 is the "Y computed" value for case 1 on table 5.

Some of the units for the logistical support cost parameters are in error in the Parenthetic Notation for Tables 1 through 10. The notations should read as follows.

(2) LSC/100 FH
(4) MMH/1,000 FH
(7) Area ($in.^2$)/100
(8) Weight (lb)
(9) Thickness (in.)
(10) No. Layers
(11) No. Panels
(12) Height Above Ground (ft)
(17) No. Aircraft/10
(18) Max Speed (kt)/100
(19) Max Alt (ft)/100
(20) Cruise Speed (kt)/100
(21) Cruise Alt (ft)/100
(22) T.O. Dist (ft)/100
(23) Stall Speed (kt)/100
(24) Ldg Dist (ft)/100
(25) Gross Wt (lb)/1,000
(26) Max (Lim) "G"
(27) Base Elevation (ft)/10
(28) Extreme Max Temp (^oF)
(29) Extreme Min Temp (^oF)
(30) Mean Max Temp (^oF)
(31) Mean Min Temp (^oF)
(32) Max Wind Speed (kt)
(33) Mean Wind Speed (kt)
(34) Humidity (%) @ 0400 LST
(35) Humidity (%) @ 1300 LST
(36) Mean Precipitation (in.)
(40) LSC per A/C per YEAR/100
*(48) MMH per A/C per 18 MONTHS/10
(57) AFH per A/C per 18 MONTHS/100
(58) AFL per A/C per 18 MONTHS/100
(59) KFH per A/C per YEAR/100
(60) KFL per A/C per YEAR/100

*To correct output to annual basis multiply by 2/3.

LST = local standard time

Pages 21 through 40

The units for the dependent logistical support cost parameters given in Tables 5 through 10 are in error.

Parameter Reads	Parameter Should Read
MAINTENANCE MAN-HOURS PER FLIGHT HOURS	MAINTENANCE MAN-HOURS PER 1000 FLIGHT HOURS
LOGISTIC SUPPORT COST PER FLIGHT HOUR	LOGISTICAL SUPPORT COST PER 100 FLIGHT HOURS
MAINTENANCE MAN-HOURS PER AIRCRAFT	MAINTENANCE MAN-HOURS PER AIRCRAFT PER 18 MONTHS/10
LOGISTIC SUPPORT COST PER AIRCRAFT	LOGISTICAL SUPPORT COST PER AIRCRAFT PER YEAR/100

Pages 21 through 40

Additional information is provided for tables 5 through 10. The identification by aircraft type for the case numbers in the tables is as follows.

TABLES 5 & 8

CASE NUMBER	AIRCRAFT TYPE
1	A-7
2	A-37
3	B-57
4	FB-111
5	F-4
6	F-15
7	F-105
8	F-111
9	T-37
10	T-38
11	OV-10

TABLES 6, 7, 9 & 10

CASE NUMBER	AIRCRAFT TYPE
1	A-7
2	A-37
3	B-52
4	B-57
5	FB-111
6	C-5
7	C-9
8	C-130
9	C-135
10	C-141
11	F-4
12	F-15
13	F-105
14	F-111
15	H-1
16	H-3
17	H-53
18	O-2
19	T-37
20	T-38
21	T-39
22	OV-10